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TECHNICAL MEMORANDUM SOIL VAPOR EXTRACTION PILOT TESTING SOIL AND NAPL OPERABLE UNIT (OU-1) DEL AMO SUPERFUND SITE July 13, 2018

INTRODUCTION

This Technical Memorandum presents results of soil vapor extraction (SVE) pilot testing completed for the SVE remedy components at Property 23 shallow outdoor soil and Source Area (SA)-6 deep soil, as described in the Remedial Design (RD) Work Plan for the Soil and Non-Aqueous Phase Liquid (NAPL) Operable Unit (OU-1) for the Del Amo Superfund Site (Site, Figure 1) (AECOM 2018).

SVE was selected as the remedy for NAPL-impacted deep soil at SA-6 in the Record of Decision (ROD) and for shallow (≤ 15 feet below ground surface [bgs]) outdoor soil at Property 23, if warranted (USEPA 2013). Pre-design investigations at Property 23 confirmed that SVE is required for shallow outdoor soil at the northeastern and eastern areas (Figure 2) (AECOM 2017a). The pilot testing was completed to collect data sufficient to determine SVE full-scale system design parameters for the two remedy components. The deep SVE remedy is required by the ROD to protect groundwater outside the impacted areas by removing NAPL to limit migration to or contact with groundwater (USEPA 2013). Findings from the deep soil SVE pilot testing at SA-6 will additionally be applied to the SVE component of the in-situ chemical oxidation (ISCO)/SVE remedy. Pilot testing and corresponding well construction was conducted in accordance with Section 4 of the RD Work Plan (AECOM 2018).

SVE is applied with an emission control technology to extract volatile organic compounds (VOCs) from the vadose zone for mass removal; thermal oxidation was used for emission control during the SVE pilot test. Benzene and ethylbenzene are the principal constituents of concern (COCs) at Property 23/SA-6. Additional vapor sampling and testing was conducted to assess the potential for polychlorinated dibenzodioxin and polychlorinated dibenzofuran (dioxin and furan) compound formation as byproducts while using a thermal oxidizer for emission control at source areas within OU-1. Dioxin and furan sampling was completed by Air Kinetics, Inc. (AKI), an emissions/source testing contractor located in Anaheim, California, under the supervision of AECOM.

WELL INSTALLATION

Two SVE wells and ten vapor monitoring (VM) wells were installed in May 2017 for both the shallow outdoor soil and the deep soil pilot tests (12 total wells) (Figure 3). Each SVE well has five associated VM wells spaced radially around it at varying distances in the respective shallow and deep zones. Extraction well SVE-1A and monitoring wells VM-1A through VM-5A are screened in shallow outdoor soil (≤ 15 feet bgs). Extraction well SVE-1B and monitoring wells VM-1B through VM-5B are screened in the deeper NAPL-impacted soil (> 15 feet bgs) with the bottom of the well screen at approximately 4 feet above the water table, which is at 46 feet bgs. Table 1 presents the well construction details for these wells. Attachment 1 includes the corresponding completed well construction diagrams.

TEST PROCEDURES

Pilot testing, field monitoring, sample collection and laboratory analyses were conducted in accordance with the procedures outlined in Section 4 of the RD Work Plan and associated Field Sampling Plan (FSP; Appendix F of the RD Work Plan) in April 2018 with details presented below.

Equipment

The pilot testing was performed using a mobile SVE unit (truck-mounted) equipped with a liquid ring pump and thermal oxidizer that was provided, permitted and operated by CalClean, Inc. of Tustin, California (CalClean) under AECOM supervision. The mobile remedial equipment was equipped with a diesel generator and a 25-horsepower liquid ring vacuum pump capable of producing a theoretical maximum of 28 inches of mercury (in. Hg) in vacuum and 410 standard cubic feet per minute (scfm) in total air flow. The thermal oxidizer used during pilot testing had a burner rating of 400,000 British thermal units (BTU) per hour maximum and propane was used as a supplemental fuel (stored in an onboard tank). The temperature set point for the thermal oxidizer during operation was 1,500 degrees Fahrenheit ($^{\circ}\text{F}$). The stack was 18 inches in diameter with a height of 17 feet from the base of the SVE unit. Equipment specifications for the thermal oxidizer are included in Attachment 2. Temporary fencing was installed around the remediation equipment to create a secure compound located in the lower east parking lot of Property 23 (Figure 3). Traffic cones were placed around the applicable extraction and monitoring wells to provide continual safe access for pilot test readings.

The appropriate extraction well during each test was connected to the extraction system inlet manifold using 2-inch diameter, above-ground vacuum hose (covered by traffic guards where appropriate) and Camlock fittings, with a section of straight pipe with sample ports installed at the wellhead to collect field readings and vapor samples. Recovered vapors were routed through a knockout tank to separate out any liquids then to a thermal oxidizer for abatement in accordance with South Coast Air Quality Management District (SCAQMD) Permit No F24496 (Attachment 2).

Instrumentation

The SVE system was equipped with an inline Pitot tube with digital manometer to measure flow, vacuum and temperature gauges, a Horiba field analyzer equipped with an infrared detector to measure total VOCs, and sample ports on the system influent and effluent lines to collect vapor samples. The Horiba was calibrated to a mix of carbon monoxide, propane and carbon dioxide to read as hexane equivalent prior to the start of the pilot test. Vapor samples for field monitoring and laboratory analysis were collected in 1-liter Tedlar[®] bags using a vacuum sampling box, for the applicable extraction well samples, and a sample pump for the influent and effluent samples.

A MiniRAE 3000 photoionization detector (PID) with a 10.6 eV lamp, calibrated to 100 parts per million by volume (ppmv) isobutylene, and a Photovac MicroFID flame ionization detector (FID), calibrated to 100 ppmv methane gas, were used to measure VOC concentrations for field monitoring vapor samples collected at the extraction wellhead. Appropriate moisture traps were used to mitigate the potential for moisture influence. A Landtec GEM2000 Landfill Gas Analyzer and Extraction Monitor (Landtec), calibrated to a mixed gas of 15 percent volume methane, 15 percent volume carbon dioxide and balance nitrogen, was used to measure fixed gases (oxygen, carbon dioxide, and methane) as percent volume for field monitoring vapor samples collected at the extraction wellhead and system influent. A carbon filter was used to obtain methane readings.

A VelociCalc[®] Air Velocity Meter 9535 was used to measure relative humidity, temperature and flow rate at the extraction wellhead.

Dwyer 477-1-FM (0 to 20 inches of water) digital manometer and Dwyer Series 2000 Magnehelic® differential pressure gauges were used to measure vacuum at the vapor monitoring wells. Dwyer Series 2000 Magnehelic® differential pressure gauges, model numbers 2010 (0 to 10 inches of water) and 2100 (0 to 100 inches of water), were used to measure vacuum at the extraction wellhead.

Baseline Measurements

Initial baseline measurements were collected on April 2, 2018, prior to step and constant rate testing for shallow soil and deep soil gas. Ambient air samples were also collected during constant rate testing to detect dioxin/furan compounds to compare to SVE emissions and to evaluate dilution air chemical mass contributions to SVE emissions.

Baseline pressure readings were collected from all extraction and vapor monitoring wells prior to operation of the SVE test equipment. Vapor samples were collected using a vacuum box with sampling pump from the applicable extraction well, SVE-1A for the shallow outdoor soil test and SVE-1B for the deep soil test, to evaluate concentrations in the subsurface. Soil vapor samples were submitted to state-certified Eurofins Calscience Environmental Laboratory under chain-of-custody procedures to be tested for total petroleum hydrocarbons as gasoline (TPH-g) by USEPA Method TO-3M; VOCs by USEPA Method TO-15M; fixed gases by ASTM Method D-1946; and methane by SCAQMD 25.1.

Step Testing

Step testing was performed during the first day of the shallow outdoor soil and deep soil pilot tests (April 2 and April 9, 2018, respectively) in order to determine the relationship between the vacuum applied to the extraction wells and the vapor flow rate. Step test data was also used to help select an appropriate applied vacuum for the subsequent constant rate testing.

Step testing was conducted by incrementally applying a vacuum to the applicable extraction well in four consecutive steps. Flow rates, temperature and applied vacuum were documented every 30 minutes for the applicable extraction well and influent line (post-dilution) during each step. Horiba, PID, FID and Landtec readings for the applicable extraction well and treatment system influent line were collected every 30 minutes. Vacuum influence measurements were recorded approximately every 15 minutes during each step at the applicable VM wells.

Vapor samples for laboratory analysis were collected from the applicable extraction well and the system influent line using a vacuum box/sample pump and Tedlar sample bags. Samples were collected at the beginning of each step interval and at the end of the last step interval. The sample analyses were the same as stated above for baseline measurement vapor samples.

Constant Rate Testing

Constant rate testing was performed for shallow outdoor and deep soil to evaluate system influent concentrations, radius of influence (ROI) and mass removal rates. Shallow outdoor soil constant rate testing was performed from April 3 – 6, 2018 with a constant vacuum applied to SVE-1A of approximately 163 inches of water (12 in. Hg), as determined during the shallow outdoor soil step test. Deep soil constant rate testing was performed from April 9 – 13, 2018 with a constant vacuum applied to SVE-1B of approximately 53 inches of water (4 in. Hg), as determined during the deep soil step test. Selected vacuums for shallow and deep soil constant rate testing are further discussed in the *Pilot Test Results* section below.

Vacuum influence measurements were recorded at applicable VM wells periodically throughout the constant rate testing. Flow rates, temperature, applied vacuum and dilution configuration were documented approximately every 90 minutes for the applicable extraction well and system influent line. Temperature readings for the system effluent (and thermal oxidizer) were recorded approximately every 90 minutes. Horiba, PID, FID and Landtec readings for the applicable extraction well and treatment system influent line, as well as Horiba readings for the system effluent line, were documented every 90 minutes.

Vapor samples were collected at the beginning, mid-point and end of the constant rate tests from the applicable extraction well, influent line and effluent line using a vacuum box/sample pump and Tedlar sample bags. As previously mentioned, soil vapor samples were submitted to state-certified Eurofins Calscience Environmental Laboratory under chain-of-custody procedures. All vapor samples collected during the constant rate testing were analyzed for TPH-g and VOCs; only samples collected from the extraction well and influent line were additionally tested for fixed gases and methane.

Dioxin/Furan Compound Sampling and Analyses

Additional vapor sampling was conducted during the constant rate testing to detect the potential production of dioxin and furan compounds in soil vapor combusted within the thermal oxidizer. Ambient air sampling was also conducted for detecting possible background dioxin / furan compounds during the SVE pilot test.

During the shallow outdoor soil constant rate test, two 24-hour background ambient air samples were collected in sequence from April 4 – 6, 2018 and three 4-hour SVE emission sampling runs were performed daily from April 4 – 6, 2018. During the deep soil gas constant rate test, three 24-hour background ambient air samples were collected in sequence from April 10 – 13, 2018 and three 4-hour SVE emission sampling runs were performed daily from April 11 – 13, 2018. During each dioxin/furan SVE emission sampling run, the thermal oxidizer system was operating at nominal capacity.

Sample collection and testing for dioxins/furans was conducted by AKI, an emissions/source testing contractor that is approved by the SCAQMD through the Lab Approval Program (Source Testing) to conduct the sampling and test methods required for dioxin and furan compound sampling and monitoring.

USEPA Method TO-9A was used to assess potential dioxin / furan concentrations in ambient air samples, which were collected in a high volume air sampler equipped with a filter and adsorbent for sampling ambient air over a 24-hour sampling period. The air sampling equipment was placed cross-wind of the SVE pilot test equipment on the south side of the onsite truck maintenance building due to access to a nearby power supply.

The following parameters were collected during each of the daily emission sampling runs at the post-thermal oxidizer sample location:

- Concentrations of dioxins and furans – California Air Resources Board (CARB) Method 428
- Sample Traverse Points – SCAQMD Method 1
- Stack Gas Flow Rate – SCAQMD Method 2
- Stack Gas Molecular Weight – SCAQMD Method 3
- Stack Gas Moisture Content – SCAQMD Method 4

The above pollutants and parameters were tested in accordance with procedures recommended in the SCAQMD Source Test Manual and CARB Stationary Source Test Manual.

The results of the test runs are reported in a source test report prepared by AKI included as Attachment 3.

PILOT TEST RESULTS

Baseline Measurements

Field Data

Table 2 summarizes the baseline vacuum readings collected with a Dwyer 477-1-FM digital manometer for all shallow and deep wells. The vacuum readings collected for shallow SVE and VM wells were all 0.0 inches of water whereas vacuum at deep SVE and VM wells ranged from 0.0 to 0.1 inches of water prior to the start of pilot testing.

Baseline vacuum readings were collected again for deep wells approximately 65 hours after shallow outdoor soil pilot testing was completed in order to confirm equilibrium conditions prior to the start of deep soil pilot testing. Equilibrium conditions were considered achieved as vacuum readings were within +/- 0.1 inches of water of the initial baseline conditions (Table 2) (AECOM 2018).

Soil Vapor Laboratory Analytical Data

Detected laboratory analytical concentrations in shallow and deep soil vapor samples are summarized in Table 3, and comprehensive laboratory analytical results are presented electronically with corresponding laboratory reports in Attachment 4. Data validation results indicate that the soil vapor data presented in this memorandum are usable for their intended purpose. Comprehensive data validation results are presented in Attachment 5. Benzene and ethylbenzene are the principal COCs detected in soil vapor based on the magnitude of the concentrations and the relative toxicities of the compounds, which is consistent with the shallow and deep soil data collected during pre-design investigations at Property 23 and SA-6 (AECOM 2017a;b).

Baseline benzene concentrations of 6,800 ppmv and 7,600 ppmv were detected at SVE-1A and SVE-1B, respectively. Baseline ethylbenzene concentrations of 1,700 ppmv and 1,900 ppmv were detected at SVE-1A and SVE-1B, respectively. TPH-g was also detected at SVE-1A with a concentration of 13,000 ppmv and SVE-1B at 12,000 ppmv. Chlorinated VOCs, tetrachloroethene (PCE) and trichloroethene (TCE), were non-detect with a laboratory detection limit of 3.4 and 3.5 ppmv, respectively, for both SVE-1A and SVE-1B. Chromatograms were reviewed for any non-target VOCs present in soil vapor during the constant rate testing for the shallow and deep zones and are further discussed later in this section.

Based on the fixed gas analyses for baseline samples, low oxygen concentrations (approximately 3 percent) and high carbon dioxide concentrations (7 percent in the shallow zone to 15 percent in the deep zone) imply aerobic biodegradation is occurring in both the shallow outdoor soil and deep soil zones but is limited by supply of available oxygen. Methane concentrations of 290 ppmv and 360 ppmv detected at SVE-1A and SVE-1B, respectively, indicates that some anaerobic (methanogenic) biodegradation is occurring in both soil zones as well.

Shallow Soil Testing

Step Test Field Data

The results of the extraction well and system influent (post-dilution) field monitoring conducted during the shallow soil step testing are presented in Table 4. Vacuum influence data collected during each step are presented in Table 5.

As the average applied vacuum to SVE-1A increased from 56 inches to 234 inches of water with each step, the average well flow rate increased from 3.4 to 9.8 scfm (Table 5). At the same time, the vacuum influence recorded at the corresponding shallow VM wells also increased from approximately 0 to 0.13 inches of water for the initial step to 0.01 to 0.94 inches of water for the final step. The observed flow rate and vacuum influence were low and consistent with the very low permeability formation in shallow soil. Based on the results of the shallow soil step test, an applied vacuum of 163 inches of water (12 in. Hg) was selected for constant rate testing corresponding to a wellhead flow rate of approximately 7.4 scfm. Vacuum influence was observed at all corresponding VM wells at these conditions; however, VM-1A showed low vacuum influence throughout the shallow soil step test indicating that the monitoring well may not have been functioning properly, possibly due to the presence of silt/clay and moisture in shallow soils, or well completion, limiting vapor flow at this well location. Furthermore, vapor samples for field monitoring and laboratory analysis could be collected at the wellhead with the vacuum sample box at these conditions. At higher system vacuums, the vacuum sample box could not overcome the blower vacuum thereby preventing the collection of vapor samples at the wellhead.

Step Test Soil Vapor Laboratory Analytical Data

Soil vapor samples were collected at the SVE-1A wellhead and system influent at the start of each step (Steps 1 through 4) and at the end of the step testing (Step 4) (Table 3). A SVE-1A wellhead vapor sample could not be collected at the start of Step 4 as the vacuum sample box could not overcome the higher blower vacuum. The soil vapor sample for the end of step testing (Step 4) was collected after the system was shut down at the completion of step testing. The concentration data increased from initial Step 1 samples to initial Step 4 samples then decreased by the end of Step 4.

Benzene concentrations at SVE-1A ranged from 3,700 to 7,800 ppmv and ethylbenzene concentrations ranged from 930 to 3,200 ppmv. These concentrations were reduced at the system influent once dilution air was added to 81 to 710 ppmv and 9 to 300 ppmv for benzene and ethylbenzene, respectively. TPH-g was also detected at SVE-1A during shallow step testing with concentrations increasing from 9,100 ppmv (Step 1) to 14,000 ppmv (Step 3) with a final concentration of 12,000 ppmv. TPH-g concentrations at the system influent (post-dilution) increased from 170 ppmv (Step 1) to a final concentration of 1,400 ppmv. During the shallow outdoor soil step testing, PCE and TCE concentrations were non-detect at SVE-1A and non-detect at the system influent.

Constant Rate Test Field Data

The results of the extraction well, system influent and effluent field monitoring conducted during the shallow soil gas constant rate testing are presented in Table 6.

The results of the field monitoring for the soil vapor samples collected at SVE-1A using the PID show high VOC concentrations of greater than 15,000 ppmv and flame out conditions for the FID (due to the high VOC and low oxygen concentrations). Fixed gas concentrations measured with the Landtec were relatively stable throughout the constant rate testing at the wellhead (oxygen ranged from 2.3 to 3.5 percent; carbon dioxide ranged from 4.7 to 12 percent). The average applied vacuum at the wellhead was 164.8 inches of water at an average flow rate of 10.9 scfm.

System influent readings were also consistent throughout the constant rate testing at a post-dilution system vacuum of 20 to 21 in. Hg and a flow rate of 72.1 to 106.8 scfm. Due to the very low permeability formation and low vapor flow rates from the shallow well, a dilution air flow rate of approximately 90 scfm was added to the extracted vapors. Total VOC concentrations (Horiba measurements) at the post-dilution system influent ranged from 129 to 458 ppmv, with an average of 372 ppmv. The constant rate test was performed for 66.42 total hours.

Vacuum influence data collected during the constant rate testing are presented in Table 7. Figure 4 includes representative vacuum influence measurements collected during the shallow outdoor soil constant rate testing (end of Day 3). Vapor monitoring well VM-1A showed minimal vacuum response whereas all other shallow VMs showed vacuums ranging from 0.14 to 1.01 inches of water, approximately 1 percent and lower of average applied wellhead vacuum (Figure 4). The minimal vacuum response observed in VM-1A, the monitoring well closest to the extraction well, implies that this well had some problem during well construction and is not functioning properly.

Constant Rate Test Soil Vapor Laboratory Analytical Data

Initial, midpoint and final soil vapor samples for laboratory analysis were collected at hours 1.4, 39.4 and 66.4, respectively, during the constant rate test from the wellhead, system influent and effluent sample locations, and the corresponding data is presented in Table 3.

As previously mentioned, benzene and ethylbenzene are the principal COCs detected in soil vapor.

For samples collected at SVE-1A, benzene was detected at an initial concentration of 4,200 ppmv that increased throughout the constant rate test with midpoint and final concentrations of 7,600 ppmv. The post-dilution system influent benzene concentration ranged from 330 to 980 ppmv with effluent concentrations less than or equal to 1.3 ppmv. Ethylbenzene at the SVE-1A wellhead increased throughout the constant rate testing from an initial concentration of 970 ppmv to a midpoint of 1,900 ppmv and a final of 3,000 ppmv. The post-dilution system influent ethylbenzene concentration ranged from 83 to 670 ppmv with effluent concentrations less than or equal to 2.2 ppmv. TPH-g was also detected in all samples collected during constant rate testing at concentrations from 13,000 to 19,000 ppmv at SVE-1A and from 890 to 1,700 ppmv at the system influent (post-dilution). TPH-g concentrations were reduced to a range of 7 to 12 ppmv at the system effluent. PCE and TCE concentrations were non-detect at SVE-1A and non-detect at the system influent during constant rate testing. Based on a review of the chromatograms for the SVE-1A influent, other hydrocarbons are present in the vapor sample at a little less than 10 percent of the sample with heptane and methanol making up the biggest fraction. Heptane and methanol are not COCs for the site.

Based on the fixed gas analyses for vapor samples collected at SVE-1A during constant rate testing, lower oxygen concentrations (3.86 to 5.63 percent) and higher carbon dioxide concentrations (8.16 to 12.4 percent) imply aerobic biodegradation is occurring in the shallow outdoor soil but is limited by supply of available oxygen, confirming the results of the baseline samples. Methane concentrations of 250 ppmv to 300 ppmv detected at SVE-1A are consistent with the corresponding baseline samples indicating that some anaerobic (methanogenic) biodegradation is also occurring in shallow soil.

Deep Soil Testing

Step Test Field Data

The results of the extraction well and system influent (post-dilution) field monitoring conducted during the deep soil gas step testing are presented in Table 8. Vacuum influence data collected during each step are presented in Table 9.

As the average applied vacuum to SVE-1B increased from 26 inches to 57 inches of water for the step test, the average well flow rate increased from 67.6 to 132 scfm (Table 9). Note that the VelociCalc flow readings for the high flow rates observed during the deep zone testing were overestimated, and this issue is discussed later in the *Constant Rate Test Field Data* section below.

At the same time, the vacuum influence recorded at the corresponding deep VM wells also increased from approximately 1.30 to 3.58 inches of water for the initial step to 2.66 to 6.35 inches of water for the final step. The observed vacuum influence and flow rates during step testing in deep soil were significantly higher than step testing in shallow soil consistent with a more permeable formation.

Based on the results of the deep soil step test, an applied vacuum of 52 inches of water was selected corresponding to a wellhead flow rate of approximately 128 scfm as measured with the VelociCalc instrument. The selected vacuum was based on anticipated operating vacuum conditions during full-scale SVE implementation.

Step Test Soil Vapor Laboratory Analytical Data

Soil vapor samples were collected at the SVE-1B wellhead and system influent at the start of each step (Steps 1 through 4) and at the end of the step testing (Step 4) (Table 3). The concentration data remained relatively stable throughout the testing.

Benzene concentrations at SVE-1B ranged from 6,900 to 8,900 ppmv and ethylbenzene concentrations ranged from 2,200 to 3,000 ppmv. These concentrations were reduced at the system influent once dilution air was added to 3,100 to 5,700 ppmv for benzene and 870 to 2,700 ppmv for ethylbenzene. However, these concentrations are still significantly higher than the system influent concentrations during the shallow soil step testing. TPH-g was also detected at SVE-1B with concentrations increasing from 17,000 ppmv (Step 1) to 19,000 ppmv (Step 4) with a final concentration of 18,000 ppmv. TPH-g concentrations at the system influent (post-dilution) ranged from 5,700 ppmv (Step 1) to 12,000 ppmv (Step 3) with a final concentration of 11,000 ppmv detected at the end of deep soil step testing. PCE and TCE concentrations were non-detect at SVE-1B and non-detect at the system influent during the deep soil step test.

Constant Rate Test Field Data

The results of the extraction well, system influent and effluent field monitoring conducted during the deep soil constant rate testing are presented in Table 10.

The results of the field monitoring for the soil vapor samples collected at SVE-1B using the PID show high VOC concentrations of greater than 15,000 ppmv and flame out conditions for the FID (due to the high VOC and low oxygen concentrations), similar to during the shallow outdoor soil pilot testing at SVE-1A. Carbon dioxide concentrations measured with the Landtec at SVE-1B were relatively stable throughout the constant rate testing (carbon dioxide was 12.2 to 14.9 percent). Oxygen concentrations increased throughout the test from 1.2 percent on Day 1 (April 9, 2018) to 7.4 percent on Day 5 (April 13, 2018). The average applied vacuum at the wellhead was 53 inches of water at an average flow rate of 128 scfm. As stated previously, the VelociCalc flow readings at the wellhead during the deep zone test were overestimated, and an approach for determining a more accurate estimate of the flow rate is discussed later in the *SVE Pilot Test Data Evaluation* section.

System influent readings were also consistent throughout the constant rate testing at a post-dilution system vacuum of 5 in. Hg and average flow rate of 116.7 scfm. The wellhead flow rates were measured with a VelociCalc during deep soil step and constant rate testing and therefore are more varied than the flow rates measured at the post-dilution system influent with an inline Pitot tube and digital manometer, and this could account for the higher average flow rate at the wellhead. Due to the permeable formation and high vapor flow rates from the deep extraction well, less dilution air was added to the extracted vapors (in comparison to the shallow soil pilot test) so these flow rates are similar and any discrepancies are due to variable field instrumentation measurements. Flow rates will be measured with inline sensors and not a handheld VelociCalc during full-scale SVE remediation. Total VOC concentrations (Horiba measurements) at the post-dilution system influent ranged from 1,543 to 3,190 ppmv, with an average of 2,000 ppmv. The constant rate test was performed for 82.25 total hours.

Vacuum influence data collected during the constant rate testing are presented in Table 11. Figure 5 includes representative vacuum influence measurements collected during the deep soil constant rate testing (end of Day 5). Vapor monitoring wells screened in both the shallow and deep zones showed vacuum response throughout the deep soil constant rate testing. VM-1B, which is the closest radial distance to SVE-1B at 15 feet, showed a vacuum response of 6.08 to 6.69 inches of water. VM-5B, which is the furthest in radial distance to SVE-1B at 50 feet, showed a vacuum response of 2.06 to 3.10 inches of water (on average approximately 5 percent of applied vacuum). Shallow extraction and vapor monitoring wells also showed vacuum response during the deep soil constant rate testing ranging from 2.72 to 5.59 inches of water (excluding VM-1A). All recorded vacuum influence readings for the deep soil constant rate test were significantly higher than 1 percent of average applied wellhead vacuum (0.52 inches of water) (Figure 5).

Constant Rate Test Soil Vapor Laboratory Analytical Data

Initial, midpoint (two) and final soil vapor samples for laboratory analysis were collected at hours 1.5, 32.75, 56.3 and 82, respectively, during the constant rate test from the wellhead, system influent and effluent sample locations, and the corresponding data is presented in Table 3.

As previously mentioned, benzene and ethylbenzene are the principal COCs detected in soil vapor.

For samples collected at SVE-1B, benzene was detected at an initial concentration of 7,900 ppmv with lower midpoint and final concentrations ranging from 4,800 ppmv (final) to 7,500 ppmv. The post-dilution system influent benzene concentrations ranged from 33 (initial) to 4,100 ppmv with effluent concentrations less than or equal to 81 ppmv. Ethylbenzene concentrations ranged from 1,900 ppmv (final) to 5,900 ppmv for samples collected at SVE-1B. The post-dilution system influent ethylbenzene concentrations ranged from 82 (initial) to 3,400 ppmv with effluent concentrations less than or equal to 310 ppmv. Note that the initial benzene and ethylbenzene system influent VOC concentrations collected on Day 1 of the deep soil gas constant rate test (April 9) were likely an error because these concentrations were unusually low and the field Horiba reading for the system influent showed a concentration of approximately 2,200 ppmv, similar to concentrations observed on the other days of the constant rate test. As a result, these initial system sampling results were not used in the analysis. Overall, benzene and ethylbenzene concentrations declined throughout the constant rate testing. TPH-g was also detected in all samples collected during constant rate testing at concentrations from 15,000 to 17,000 ppmv at SVE-1B and from 8,500 to 8,900 ppmv at the system influent (post-dilution). TPH-g concentrations were reduced to a range of 110 to 570 ppmv at the system effluent.

The effluent benzene and ethylbenzene analytical concentrations are higher than the effluent VOC concentrations recorded in the field during the constant rate testing. Effluent VOC concentrations recorded in the field with the Horiba did not exceed 3 ppmv whereas effluent analytical concentrations ranged from 17 to 81 ppmv for benzene and 39 to 310 ppmv for ethylbenzene. The likely reason for the elevated effluent concentration is that the flow rates and total hydrocarbon throughput for the deep soil pilot test (12 to 13 pounds per hour) were higher than the oxidizer capacity with a 400,000 BTU per hour rating. However, by Day 4 of the constant rate test, the influent and effluent concentrations decreased and the destruction efficiency increased, indicating that the conditions were within an appropriate range for the pilot test oxidizer by Day 4. Another possibility is that because the same sample pump was used to collect both system influent and effluent laboratory samples, the effluent analytical concentrations could have been affected. This was not observed during the shallow soil pilot testing possibly due to the significantly lower system influent concentrations.

Regarding the analytical results for other VOCs in soil vapor, PCE concentrations ranged from 16 ppmv (J-flag estimate) to non-detect at SVE-1B and all system influent concentrations were non-detect during constant rate testing. TCE concentrations were non-detect at SVE-1B and system influent concentrations ranged from 9.3 ppmv (J-flag estimate) to non-detect during constant rate testing. Based on a review of the chromatograms for the SVE-1B influent, other hydrocarbons are present in the vapor sample at less than 10 percent of the sample with heptane and methanol making up the biggest fraction. Heptane and methanol are not COCs for the site.

Based on the fixed gas analyses for vapor samples collected at SVE-1B during constant rate testing, lower oxygen concentrations (3.04 to 8.4 percent) and higher carbon dioxide concentrations (13.8 to 15.9 percent) imply aerobic biodegradation is occurring in deep soil but is limited by supply of available oxygen, confirming the results of the baseline samples. Methane concentrations of 82 ppmv to 270 ppmv detected at SVE-1B indicate that some anaerobic (methanogenic) biodegradation is also occurring in deep soil.

Dioxin/Furan Sampling

Results for the additional effluent sampling conducted by AKI during the constant rate testing to detect the potential production of dioxin and furan compounds in soil vapor combusted within the thermal oxidizer are summarized in Table 12. Ambient air sampling results are summarized in Table 13. Attachment 3 includes AKI's testing report with the comprehensive analytical results.

During the shallow outdoor soil constant rate test at SVE-1A, three 4-hour SVE emission sampling runs were performed daily from April 4 – 6, 2018. The emission rates for total polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) during these runs ranged from 2.04E-11 to 2.56E-10 pounds per hour, for an average rate of 1.09E-10 pounds per hour. This corresponds to a total PCDDs/PCDFs concentration range for these runs of 0.0588 to 0.73 nanograms per dry standard cubic meter (ng/dscm).

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The two 24-hour background ambient air samples collected in sequence from April 4 – 6, 2018 during the shallow outdoor soil constant rate test had detections of 8.59E-04 and 6.91E-05 ng/dscm. The corresponding SVE emission concentrations exceeded these background detections.

During the deep soil constant rate test at SVE-1B, three 4-hour SVE emission sampling runs were performed daily from April 11 – 13, 2018. The emission rates for total PCDDs and PCDFs during these runs ranged from 6.24E-12 to 1.74E-11 pounds per hour, for an average rate of 9.99E-12 pounds per hour. This corresponds to a total PCDDs/PCDFs concentration range for these runs of 0.0128 to 0.0359 ng/dscm.

The four 24-hour background ambient air samples collected in sequence from April 9 – 13, 2018 during the deep soil constant rate test had detections from 1.43E-04 to 1.56E-03 ng/m³. The corresponding SVE emission concentrations exceeded these background detections. Also, note that the PCDD/PCDF concentration was higher in the shallow soil test than the deep test, though there were no detections of chlorinated compounds in the shallow test,

SVE PILOT TEST DATA EVALUATION

Flow Rate vs Vacuum

The relationship between applied wellhead vacuums versus soil vapor flowrates was evaluated by plotting data graphically, and determining the slope and correlation coefficient (i.e., goodness-of-fit) for that slope. Plots of vapor extraction rates versus applied wellhead vacuums for SVE-1A and SVE-1B are presented in Figures 6 and 7, respectively. The stepped-rate flow characteristics for both SVE wells exhibited increasing flows as wellhead vacuums increased, as expected.

Significantly higher measured flowrates were achieved in the deep soil zone (67-138 scfm) with lower applied vacuums (26-65 inches of water) during the deep soil step test in comparison to the shallow zone step test results (3-13 scfm; 48-238 inches of water). However, it should be noted that the high wellhead flowrates measured by the VelociCalc during the deep soil pilot test were likely overestimated by approximately 75 percent based on a mass balance with benzene and ethylbenzene concentrations (Attachment 6). Hence, the deep zone flow rates likely ranged between 40 and 79 scfm, which is still significantly higher than the shallow zone flow rates. These results are consistent with our understanding of the site lithology that the deep zone contains layers of more permeable soils that are expected to readily support SVE and provide a relatively large radius of influence. Examples of layers of high permeability sand can be found in the 28-32 feet bgs and 38-42 feet bgs layers (see Attachment 7). There is also a permeable shell hash layer at 46 feet bgs but the SVE wells are not screened in that interval so this permeable layer may not be contributing as much to the higher flow rates observed in the deep zone. In contrast, the shallow zone contains very low permeability soils with a relatively small radius of influence; however, SVE is considered feasible in this zone.

Radius of Vacuum Influence

Attachment 8 includes pressure-based ROI assessments for each SVE well using the last set of operational and vacuum data collected for each day of constant rate testing (April 3-6; April 9-13, 2018) as well as the last set of data collected for the stepped-rate tests. One estimate of the ROI was obtained by projecting the trend line from each data set to the radial distance where subsurface pressure is predicted to be 0.5 inches water.

Soil porosity data determined from previous physical property testing of shallow and deep soils at Property 23 and SA-6, respectively, was used in the assessments (AECOM 2017a; b). VM-1A data was excluded from the shallow zone assessment due to showing minimal (anomalous) vacuum response.

Figures 8 and 9 are representative ROI plots for shallow outdoor soil and deep soil during constant rate testing, respectively, while Attachment 8 includes all assessments. Observation well data are plotted for each SVE test well constant rate flow/pressure, and a best-fit trend line is applied to the data. Based on the best fit trend line and minimum vacuum criterion, the ROI for the shallow zone is in the range of 13 to 17 feet, and 15 feet is selected as a reasonable estimate. Similarly, the deep zone vacuum-based ROI is estimated to be approximately 100 feet. However, the presence of a minimum vacuum does not ensure remediation in an adequate timeframe. Further discussion of the pore gas velocity approach to selecting radius of influence is presented below.

Soil Permeability and Pore Gas Velocity

Permeability is a function of soil grain size, soil porosity, soil uniformity and soil moisture content. Therefore, determination of the soil air permeability properties is a useful parameter for the design and assessment of future full-scale SVE well networks. Soil air permeability properties of subsurface soils may impact decisions regarding well spacing, achievable flow rates, achievable mass removal rates, and SVE well construction.

Attachment 8 includes estimates for soil permeability and pore gas velocity using the same datasets as for the ROI assessments. An average wellhead flowrate of 69 scfm based on the mass balance presented in Attachment 6 was used for these calculations instead of the higher VelociCalc-measured flowrates so as not to overestimate the soil permeability and pore gas velocity values. The K_{air} estimates are approximately 0.2 to 0.3 Darcy for the shallow zone, and approximately 7 Darcy for the deep zone. These values are generally higher than the laboratory testing results (Attachment 9) (AECOM 2017a;b). It is possible that the soil core analyzed in the lab did not accurately represent the channeling/fracturing or macropore structures of subsurface soils.

Pore gas velocity is the rate of movement of soil vapors towards an extraction well connected to an SVE system. Pore gas velocity decreases with increasing distance from the extraction well. Average pore gas velocity is an additional design criterion in determining number and spacing of extraction wells for SVE. Using the soil permeability values discussed earlier, pore gas velocity can be estimated for a given extraction rate. It is desirable to have a pore gas velocity throughout the treatment zone of at least 0.01 centimeters (cm) per second (30 feet per day) (USACE 2002). Identifying a ROI based on this criterion can avoid the inaccuracy of a purely vacuum-based ROI where pore gas velocities sometimes are not adequate for remediation in a reasonable timeframe.

Figures 10 and 11 are representative pore gas velocity graphs for shallow outdoor soil and deep soil during constant rate testing, respectively, while Attachment 8 includes all assessments. Note that pore gas velocity graph for the deep zone used the revised flow rates (rather than the VelociCalc flowrate readings).

For shallow ROI assessments performed by projecting the trend line from each data set to the radial distance where subsurface pressure is predicted to be 0.5 inches water, the corresponding pore gas velocities are approximately equal to 0.01 cm per second. Therefore, the use of a ROI of 15 feet for the shallow zone to determine well spacing will be appropriate for implementing SVE to the extent practicable. However, for the deep ROI evaluation, the radial distance where pore gas velocity is equal to 0.01 cm per second is in the range of 30 to 65 feet away from each extraction well compared to the 100-foot ROI based on the vacuum criterion. Therefore, for the deep wells a more conservative ROI of 50 feet would be more appropriate. Further discussion of well spacing is presented later in discussion of the preliminary design approach.

VOC Mass Removal Rates

In general, soil gas concentrations of VOCs measured at the system influent increased over time during the shallow outdoor soil pilot test (Figure 12) and decreased over time during the deep soil pilot test (Figure 13). System influent concentrations were significantly higher from the deep soil zone with readings ranging from 1,543 to 3,190 ppmv (Table 10) compared to shallow soil zone system influent readings from 129 to 458 ppmv (Table 6). This is because the flow rates from the shallow extraction well SVE-1A were very low and a significant amount of dilution air was required for proper operation of the blower, which significantly reduced the system influent concentrations.

High concentrations of benzene and ethylbenzene were observed in laboratory analysis samples collected from each SVE well. Benzene was detected in all soil vapor samples collected from SVE-1A and SVE-1B at concentrations ranging from 3,700 to 7,800 ppmv and 4,800 to 8,900 ppmv, respectively. Ethylbenzene was detected in all soil vapor samples collected from SVE-1A and SVE-1B at concentrations ranging from 930 to 3,200 ppmv and 1,900 to 5,900 ppmv, respectively. Detection limits of VOCs can be elevated when high concentration volatile organics (e.g., benzene) are present in the sample, requiring dilution for accurate quantitation and instrument protection. If dilution is required, the detection limit of all compounds is elevated by the dilution factor, regardless of their presence or absence.

Chlorinated VOCs were all non-detect in soil vapor samples collected at SVE-1A and SVE-1B, with the exception of one SVE-1B sample where PCE was detected at a concentration of 16 ppmv (J-flag estimate).

For the shallow vapor extraction zone, the average concentrations for benzene and ethylbenzene detected at the system influent during the constant rate testing of 657 and 358 ppmv, respectively, were used to calculate mass removal rates with the average system flowrate of 100.7 scfm during constant rate testing. The average mass removal rates for benzene and ethylbenzene during the constant rate testing were 0.82 and 0.61 pounds per hour, respectively.

For deep soil, the average concentrations for benzene and ethylbenzene detected at the system influent during the constant rate testing of 3,533 and 2,633 ppmv, respectively, were used to calculate mass removal rates with the average system flowrate of 116.7 scfm during constant rate testing. The average mass removal rates for benzene and ethylbenzene during the constant rate testing were 5.10 and 5.16 pounds per hour, respectively.

Attachment 10 includes calculation details for the mass removal rates presented above as well as graphs of mass removal rates over time during shallow outdoor and deep soil constant rate testing. Note that the mass removal rates were estimated with the system influent flow rates and concentrations and were therefore not affected by the VelociCalc field reading of flow rates.

Oxygen concentrations were low in all soil vapor samples collected from SVE-1A and SVE-1B wellheads during constant rate testing, ranging from 3.86 to 5.63 percent by volume for SVE-1A and 3.04 to 8.4 percent by volume for SVE-1B. Carbon dioxide concentrations were elevated in all soil vapor samples, ranging from 8.16 to 12.4 percent for SVE-1A and from 13.8 to 15.9 percent for SVE-1B. Note that carbon dioxide concentrations are generally inversely proportional to oxygen concentrations in soil gas. Graphs of oxygen and carbon dioxide analytical concentrations measured during constant rate testing are included in Attachment 10. Oxygen and carbon dioxide concentrations detected in laboratory analyses soil vapor samples are consistent with field measurements using the Landtec monitoring device. Methane concentrations ranged from 250 to 300 ppmv at SVE-1A and 82 to 270 ppmv at SVE-1B.

Dioxin/Furan and Other Emission Results Evaluation

Dioxin/furan and toxic air contaminant (TAC) emissions from the thermal oxidizer operated during the pilot test and potential emissions from full-scale SVE design were applied to the SCAQMD risk screening tool for demonstrating compliance with Rule 1401 entitled New Source Review for Toxic Air Contaminants in order to show consistency with the SCAQMD rules and regulations. Rule 1401 was originally adopted in 1990 and modified since to accommodate changing risk values from the California Office of Environmental Health Hazard Assessment (OEHHA) and policies of the SCAQMD. This rule is a prescriptive rule to demonstrate that new sources do not pose a cancer, chronic or acute human risk to the community (SCAQMD 2017).

Rule 1401 procedures were followed based on the nearest residential receptor distance of approximately 400 meters and nearest commercial receptor distance of approximately 50 meters from the potential location of the full-scale SVE system with thermal oxidation controls (assumed to be along the southern property boundary south of the maintenance building, Attachment 11) relative to the nearest complete and representative meteorological dataset from Hawthorne Municipal Airport, located inland approximately 5 miles from the site.

SCAQMD has developed an Excel-based Rule 1401 screening risk tool to address the first three tiers of the Rule 1401 procedures (SCAQMD 2017). Tiers are designed to be used in order of increasing complexity such that if compliance cannot be demonstrated using one tier the dataset is applied to a higher tier providing a more refined estimate of risk. If compliance can be shown with a lower tier, higher tiered analyses are not required.

Dioxin and furan emissions applied for the risk evaluation were the congener-specific mass emissions presented in Attachment 3, Appendix A. TACs included in the risk assessment were the VOCs detected in the effluent of the thermal oxidizer during the shallow outdoor and deep soil pilot tests (i.e., benzene, ethylbenzene) (Table 3). Emission rates needed as inputs for the tiered evaluation were calculated based on full-scale SVE system flow rates, assumed to be 500 scfm, and these inputs are summarized in Attachment 11. The tiered evaluation was conducted based on residential receptors 400 meters away and commercial receptors 50 meters away. Two scenarios were evaluated with two cases of emission rates for each scenario as outlined below:

Scenario 1 – Dioxin/Furan emissions only

- Case 1 – Blended flow rate assuming 150 scfm from shallow-screened wells and 350 scfm from deep-screened wells and corresponding worst-case effluent concentrations from the SVE dioxin/furan emission sampling runs performed during the shallow and deep soil pilot tests.

- Case 2 – Assumed total flow rate of 500 scfm multiplied by the worst-case dioxin/furan effluent concentration from the pilot test (i.e., SVE emission sampling run 2 during shallow pilot testing) for a more conservative worst-case estimate of dioxin/furan emission rates from the thermal oxidizer.

Scenario 2 – Dioxin/Furan and TAC emissions

- Case 1 –

Dioxin/Furan emissions: Scenario 1, Case 1

TAC emissions: Blended flow rate assuming 150 scfm from shallow wells and 350 scfm from deep wells with worst-case effluent TAC concentrations for shallow soil (i.e., detected effluent data on April 5, 2018 during shallow constant rate testing [see Table 3]) and representative effluent TAC concentrations for deep soil (i.e., detected effluent data on April 13, 2018 during Day 4 of deep constant rate testing [see Table 3]). Effluent TAC concentrations collected on Day 4 of the deep soil constant rate testing are more representative for a thermal oxidizer with an almost 99 percent VOC destruction efficiency (further discussion of this below).

- Case 2 –

Dioxin/Furan emissions: Scenario 1, Case 1

TAC emissions: Assumed total flow rate of 500 scfm multiplied by a benzene concentration of 25 ppmv and ethylbenzene concentration of 50 ppmv for TAC emission rates with the objective of identifying a higher concentration limit that would still meet the SCAQMD limits.

The table below presents a summary of the Tier 2 evaluation for Scenario 1 (dioxin/furan emissions alone) for the 500 scfm thermal oxidizer. The Tier 2 evaluation was conducted as the Tier 1 threshold was exceeded in both cases. The Tier 2 results show that the potential exposure risks for the residential and commercial receptors are below SCAQMD limits, even with the worst-case emissions data. Based on the dioxin-furan emissions alone, the oxidizer would be in compliance with Rule 1401 requirements. The Rule 1401 screening risk tool spreadsheets are included in Attachment 11, which present more details for each case.

Scenario 1. Dioxin/Furans only HRA ¹	HRA Results					
	Residential receptor 400 m Commercial receptor 50 m					
	Tier 2					
	Cancer Residential ²	Cancer Worker ²	Cancer Burden	Acute	chronic	8 hour Chronic
SCAQMD Limit:	1.0E-06	1.0E-06	0.5	1.0	1.0	1.0
Case 1	2.33E-08	5.81E-09	N/A	0.00	0.00	0.00
Case 2	5.89E-08	1.51E-08	N/A	0.00	0.00	0.00

[1] See Attachment 11 for detailed Rule 1401 risk tool spreadsheet.

[2] Per SCAQMD, a thermal oxidizer is considered Best Available Control Technology for Toxics (T-BACT) for VOCs and TACs which raises the health risk assessment (HRA) allowable limit from 1.0E-06 to 10.0E-06. However, as a conservative measure a limit of 1.0E-06 (no T-BACT) is used in this evaluation.

The table below presents a summary of the Tier 3 evaluation results for Scenario 2 (Case 1 and 2 described above), which includes dioxin/furan and TACs emissions for the proposed 500 scfm thermal oxidizer for the residential and commercial receptors. Tier 3 evaluation results are presented for the two cases because the Tier 1 and Tier 2 criteria were exceeded.

Case 1 shows that the Tier 3 evaluation results using pilot test effluent data with the blended flow rate of the shallow and deep wells as described previously do not exceed the SCAQMD limits. It should be noted that effluent data for deep soil collected on Day 4 of deep soil constant rate testing (April 13, 2018) was used rather than the worst-case data as it would be more representative of a normally operating thermal oxidizer with a destruction efficiency of approximately 99 percent. As discussed below, the destruction efficiency was lower on the previous days of the deep soil testing because the hydrocarbon throughput was higher than the relatively small pilot test thermal oxidizer could treat. A full-scale thermal oxidizer would be designed to handle the higher hydrocarbon throughputs and still attain a minimum of 99 percent destruction efficiency.

Case 2 shows that for higher benzene (25 ppmv) and ethylbenzene (50 ppmv) effluent concentrations, the Tier 3 results are below the SCAQMD limits. Thus, both cases meet the SCAQMD requirements.

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HRA Results Residential receptor 400 m Commercial receptor 50 m						
Tier 3						
Scenario 2. Dioxin/Furans and TACs HRA¹	Cancer Residential²	Cancer Worker²	Cancer Burden	Acute	chronic	8 hour Chronic
SCAQMD Limit:	1.0E-06	1.0E-06	0.5	1.0	1.0	1.0
Case 1	5.37E-07	2.46E-07	N/A	0.07	0.06	0.06
Case 2	9.51E-07	4.37E-07	N/A	0.12	0.10	0.10

[1] See Attachment 11 for detailed Rule 1401 risk tool spreadsheets.

[2] Per SCAQMD, a thermal oxidizer is considered T-BACT for VOCs and TACs which raises the HRA allowable limit from 1.0E-06 to 10.0E-06. However, as a conservative measure a limit of 1.0E-06 (no TBACT) is used in this evaluation.

A separate SCAQMD requirement that is applicable to thermal oxidizer implementation at the Site is related to the potential production of hydrogen chloride vapors from the combustion of chlorinated VOCs present in the influent (i.e., PCE, TCE). Based on the shallow outdoor and deep soil pilot testing laboratory sampling results, PCE was below detection limits in all 17 influent samples and all wellhead samples except for one sample collected during constant rate testing at SVE-1B (16 ppmv, J-flagged data), as discussed earlier. TCE was below detection limits in all wellhead samples and 15 out of 17 influent samples except in two cases where TCE was present at 9 and 4 ppmv (J-flagged data) during constant rate testing at SVE-1B. The limited detections of PCE and TCE were only from the deep zone wells. Based on the relatively low to non-detect concentrations of PCE and TCE observed during the pilot testing, as well as the ability to limit the number of operating SVE wells and control dilution air during the initial startup period, a thermal oxidizer can be operated so as to not exceed the 1 pound per day limit of the SCAQMD Regulation XIII Rule 1303. PCE and TCE concentrations, if detected in future SVE operations, are expected to decline rapidly after the initial weeks of operation.

Effectiveness of Thermal Oxidizer for Vapor Treatment

The table below shows the total VOC influent and effluent analytical concentrations and corresponding destruction efficiencies of the thermal oxidizer used in the pilot test for shallow outdoor and deep soil constant rate testing. The results show that the destruction efficiency was high (>99 percent) during shallow testing (with lower analytical concentrations) but lower during the deep testing (with higher analytical concentrations).

Total VOCs (Benzene+Ethylbenzene)			
Sample Collected (elapsed time)	Influent (ppmv)	Effluent (ppmv)	Control Efficiency (%)
Shallow Outdoor Soil Constant Rate Test			
Hour 1.4	413	2.1	99.50
Hour 39.4	1,650	4.5	99.79
Hour 66.4 (end)	980	2.5	99.75
Deep Soil Constant Rate Test			
Hour 32.75	7,100	391	94.49
Hour 56.3	7,500	194	97.41
Hour 82 (end)	3,900	58	98.51

The deep soil pilot test control efficiencies are lower (i.e. effluent concentrations are elevated) likely due to the higher than expected hydrocarbon mass throughput through the pilot test oxidizer. This pilot test oxidizer was relatively small with a burner capacity of 400,000 BTU per hour, and the hydrocarbon mass loading with the deep test likely exceeded the range of concentrations where the oxidizer can deliver a >99 percent destruction efficiency.

The reduced destruction efficiency during deep testing was not evident during the field testing as the field instrumentation did not show elevated concentrations. The elevated effluent concentrations were not known until all the laboratory results came back two weeks after the test was complete. If the elevated effluent concentration condition was known during the field testing, modifications such as reducing the applied vacuum to reduce VOC influent concentrations and/or increasing the oxidizer temperature (e.g. 1,600 °F) could have been implemented to reduce effluent concentrations and increase destruction efficiency. In addition, it is possible that the use of the same sample pump to collect both the influent and effluent samples for lab analysis could have affected the effluent sample during deep testing. However, note that destruction efficiency during the deep test increased by the fourth day of the constant rate testing to 98.5 percent likely due to decreasing influent concentrations bringing the hydrocarbon mass loading closer to the optimal range for the size of the pilot test oxidizer.

PRELIMINARY CONCEPTUAL SVE DESIGN

This section presents a preliminary conceptual plan for the SVE system at Property 23/SA-6 based on the pilot testing results that will be further detailed in future RD submittals.

Shallow Soil Zone

SVE is considered effective in shallow soils but requires closely spaced extraction wells based on an ROI of approximately 15 feet (at 0.5 inches of water) and low air permeability of $2 \times 10^{-9} \text{ cm}^2$ (0.2 to 0.3 Darcy). Figure 14 proposes a full-scale SVE system design for remediation of shallow outdoor soil with 15 extraction wells spaced approximately 22 feet apart to treat the proposed targeted area adjacent to the east side of the building. The lithology in the shallow zone is relatively uniform with a high percentage of silt/clay and no significant sandy zone. Hence, the recommended well screen interval is the same as that used during the pilot test, namely, 7 to 15 feet bgs.

In response to USEPA comments on the *Shallow Soil Sampling Results for Property 23 Technical Memorandum*, AECOM proposed to install four additional soil borings to confirm the extent of the proposed shallow SVE implementation areas – northeast and east. The shallow outdoor soil SVE areas may be modified if these additional soil borings show exceedances of cleanup levels. Shallow SVE wells will be spaced similarly (22 feet apart) in the northeast area and to the east area once delineation is complete.

Deep Soil Zone

SVE is expected to be effective in the deep zone with relatively high air permeability (approximately 7 Darcy) and radius of vacuum influence (100 feet at 0.5 inches of water) as well as mass removal rates that are significantly higher than the shallow zone. However, there are low permeability layers (see Attachment 9 showing permeability of some layers < 0.01 Darcy) within the deep zone that will face some inherent limitations of SVE in remediation of low permeability silt/clay layers. A review of the lithology in the deep vadose zone at SA-6 indicates that the high vapor flow rates are likely occurring through the known permeable sandy layers between 28 – 32 feet bgs and 38 – 42 feet bgs. Based on the physical properties testing conducted in previous investigations, the 28 to 32 feet bgs layer is likely the most significant contributor to the deep SVE flow with a high horizontal and vertical permeability of 8.3 Darcy and 10.6 Darcy for the 29-foot sample based on soil physical properties testing (AECOM 2017b). A representative cross-section for SA-6 and corresponding boring logs installed during pre-design investigations for Property 23 shallow soil and SA-6 deep soil are included as Attachment 7. In addition, there are known permeable layers such as the shell hash layer around 46 feet bgs that is below the screened interval of extraction well SVE-1B and, because it is a continuous layer that is present across SA-6, this could be contributing to the air flow as well. Other permeable cemented gravel and cemented sand layers are reported in boring logs at various depths like 21 feet bgs, 24 feet bgs and 37 feet bgs though these may not be continuous across SA-6.

Figure 15 proposes a full-scale SVE system design for remediation of deep soil with four proposed extraction well locations spaced approximately 60 feet apart with each location incorporating two screened intervals (SVE-1B/C, SVE-2B/C, SVE-3B/C and SVE-4B/C). This design allows for a zone of high pore gas velocity with a radius of 50 feet around each well to remediate the targeted area. It should be noted that despite the large radius of vacuum influence (100 feet for 0.5 inches of water vacuum), the proposed SVE well spacing was reduced and number of SVE wells increased as a conservative measure to ensure that all of the soil layers, including lower permeability soil layers, are addressed by SVE to the extent practicable. Furthermore, dividing the deep vadose zone (15 to 46 feet bgs) into two screened intervals (B screen of 19 to 31 feet bgs and C screen of 35 to 43 feet bgs) helps mitigate the risk of any one highly permeable flow pathway capturing a majority of the deep soil vapor flow. In this proposed plan, the existing extraction well SVE-1B will be replaced by dual-screened wells SVE-1B/C.

AECOM noted in response to USEPA comments on the *Deep Soil Sampling Results for Source Area 6 Technical Memorandum* that the only area where the identified SVE area is not effectively constrained is in the vicinity of soil boring SBL0601. Therefore, AECOM recommended one additional deep soil boring located to the north east of SBL0601 (presented on Figure 15) to confirm the extent of the target SVE area.

Vapor Extraction and Treatment System

Figure 16 shows a typical process and instrumentation diagram for a vapor extraction and treatment system. Preliminary design components for the vapor extraction and treatment system that will be connected by piping to the proposed shallow and deep SVE well designs discussed above include:

- Positive Displacement blower
- Maximum vacuum, 12-inch Hg (160 in WC)
- Flow rate, 500 scfm
- Vapor treatment: thermal oxidizer
- Fuel: Natural gas or propane

Additional evaluation of the sizing, type of thermal oxidizer and location of blower and treatment equipment on the property will be conducted during the next remedial design phase. In order to meet the requirements of the SCAQMD for a 500 scfm thermal oxidizer, the benzene and ethylbenzene influent concentrations and effluent emissions will need to be controlled to meet the SCAQMD limits. Similarly, the PCE and TCE concentrations in the SVE influent will need to be monitored during startup to confirm that the SCAQMD requirement of less than 1 pound per day of chlorine (from PCE, TCE) in the influent is met. These requirements will be met by balancing the number and type of extraction wells (shallow, deep) along with the use of dilution air, and the selection of an appropriately-sized thermal oxidizer with a 99 percent or greater VOC destruction efficiency at the operational flow rates. Thermal destruction efficiencies vary by oxidizer design and operational parameters such as residence time and temperature. Based on initial review, a direct-fired thermal oxidizer design would be the preferred option for this SVE remediation.

Based on the decreasing VOC concentrations observed during the 5 days of the deep soil pilot test, high SVE influent concentrations are expected to only last for the initial weeks (start-up period) of full-scale treatment. The SVE operational approach will be to only connect one deep well at a time to the blower with weekly sampling for laboratory analytical testing incorporated to document compliance with emission limits based on the Tier 3 evaluation.

Further details of the shallow outdoor soil SVE remedy for Property 23 and deep soil SVE remedy for SA-6 design, implementation and operation will be presented in the subsequent 30%, 95% and 100% Remedial Design Reports.

REFERENCES

AECOM, 2018. *Remedial Design Work Plan for the Soil and NAPL Operable Unit, Del Amo Superfund Site, Los Angeles, California*. Revised January 16.

2017a. *Technical Memorandum, Shallow Soil Sampling Results for Property 23, Predesign Investigation, Soil and NAPL Operable Unit, Del Amo Superfund Site*. September 8.

2017b. *Technical Memorandum, Deep Soil Sampling Results for Source Area 6, Pre-design Investigation, Soil and NAPL Operable Unit, Del Amo Superfund Site*. September 8.

SCAQMD, 2017. Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.1, South Coast Air Quality Management District, <http://www.aqmd.gov/home/permits/risk-assessment>. September 1.

US Army Corps of Engineers (USACE), 2002. Soil Vapor Extraction and Bioventing – Engineering and Design, Engineer Manual, US Army Corps of Engineers. June.

USEPA, 2013. Record of Decision, Del Amo Facility 7 Superfund Site, Soil and NAPL Operable Unit, Los Angeles, California. September 2013 revision.

FIGURES

Figure 1 – Site Location Map

Figure 2 – Property 23/SA-6 SVE Remediation Areas

Figure 3 – SVE Pilot Test Well Locations and Proposed Extent of SVE Treatment

Figure 4 – Representative Vacuum Influence during Shallow Outdoor Soil Constant Rate Testing

Figure 5 – Representative Vacuum Influence during Deep Outdoor Soil Constant Rate Testing

Figure 6 – Shallow Step Test SVE-1A; Flow Rate versus Wellhead Vacuum

Figure 7 – Deep Step Test SVE-1B; Flow Rate versus Wellhead Vacuum

Figure 8 – Representative Shallow Zone ROI - Test Run #4: SVE-1A; end of day 2 constant rate test

Figure 9 – Representative Deep Zone ROI - Test Run #10: SVE-1B; end of day 3 constant rate test

Figure 10 – Soil Gas Pore Velocity versus Radial Distance from SVE-1A - Test Run #4: end of day 2 constant rate test

Figure 11 – Soil Gas Pore Velocity versus Radial Distance from SVE-1B - Test Run #10: end of day 3 constant rate test

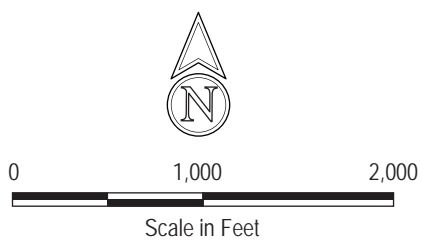
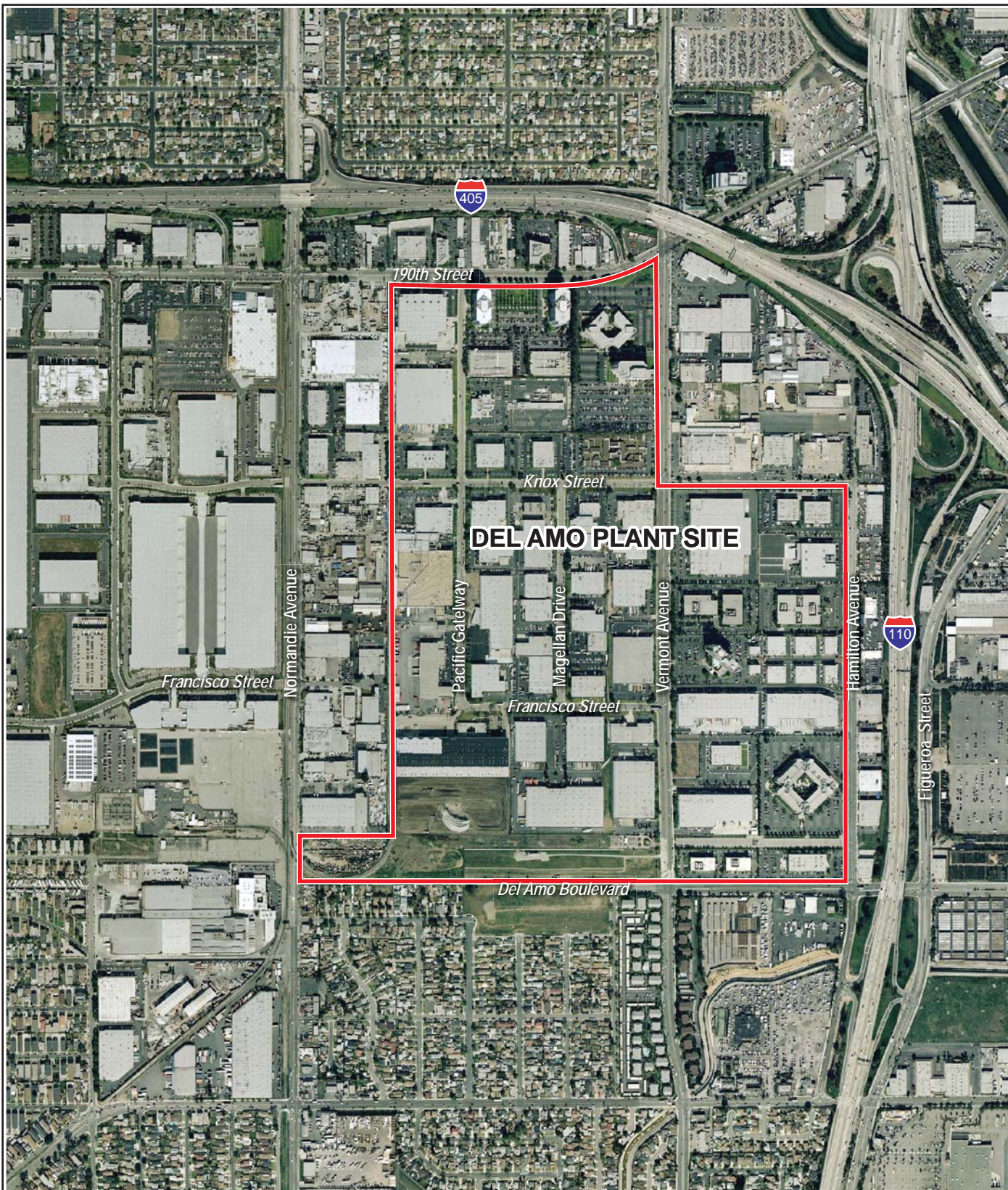
Figure 12 – Soil Vapor Concentrations and Mass Removal Rates (Shallow Zone Constant Rate Testing)

Figure 13 – Soil Vapor Concentrations and Mass Removal Rates (Deep Zone Constant Rate Testing)

Figure 14 – Proposed Layout for Shallow SVE Wells

Figure 15 – Proposed Layout for Deep SVE Wells

Figure 16 – SVE System Process & Instrumentation Diagram



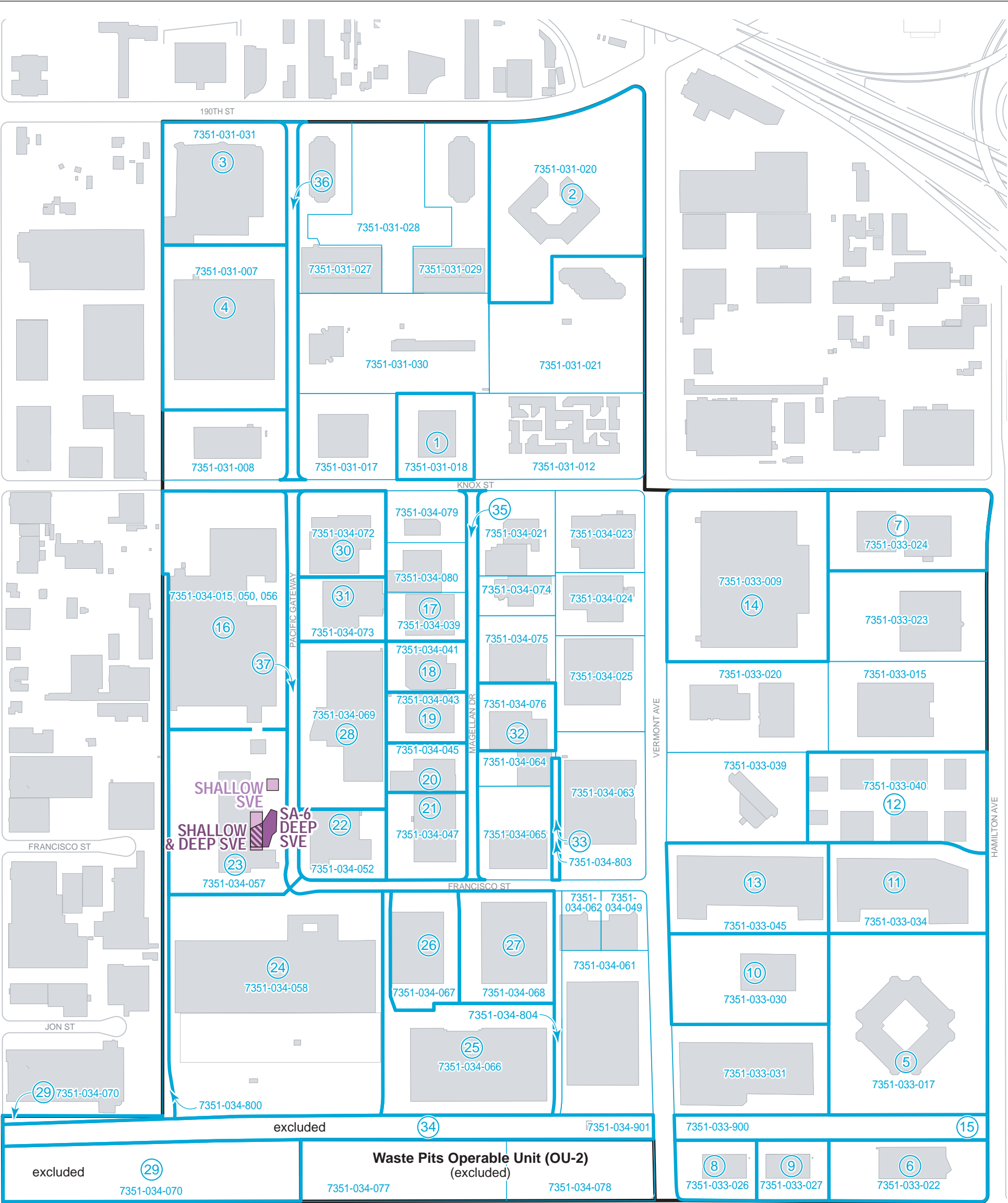
Source: AirPhotoUSA dated February 2006

FIGURE 1

SITE LOCATION MAP

SVE Pilot Test Report
Soil and NAPL Operable Unit - OU1
Del Amo Superfund Site

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Legend

- Deep soil vapor extraction (SVE)
- Shallow soil vapor extraction (SVE)
- Shallow and deep SVE
- Current building footprint
- Property and number (corresponds with Exposure Area of Potential Concern (EAPC) identified in the Baseline Risk Assessment)
- Assessor's parcel number

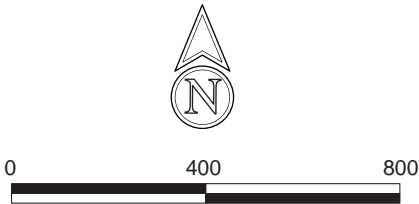
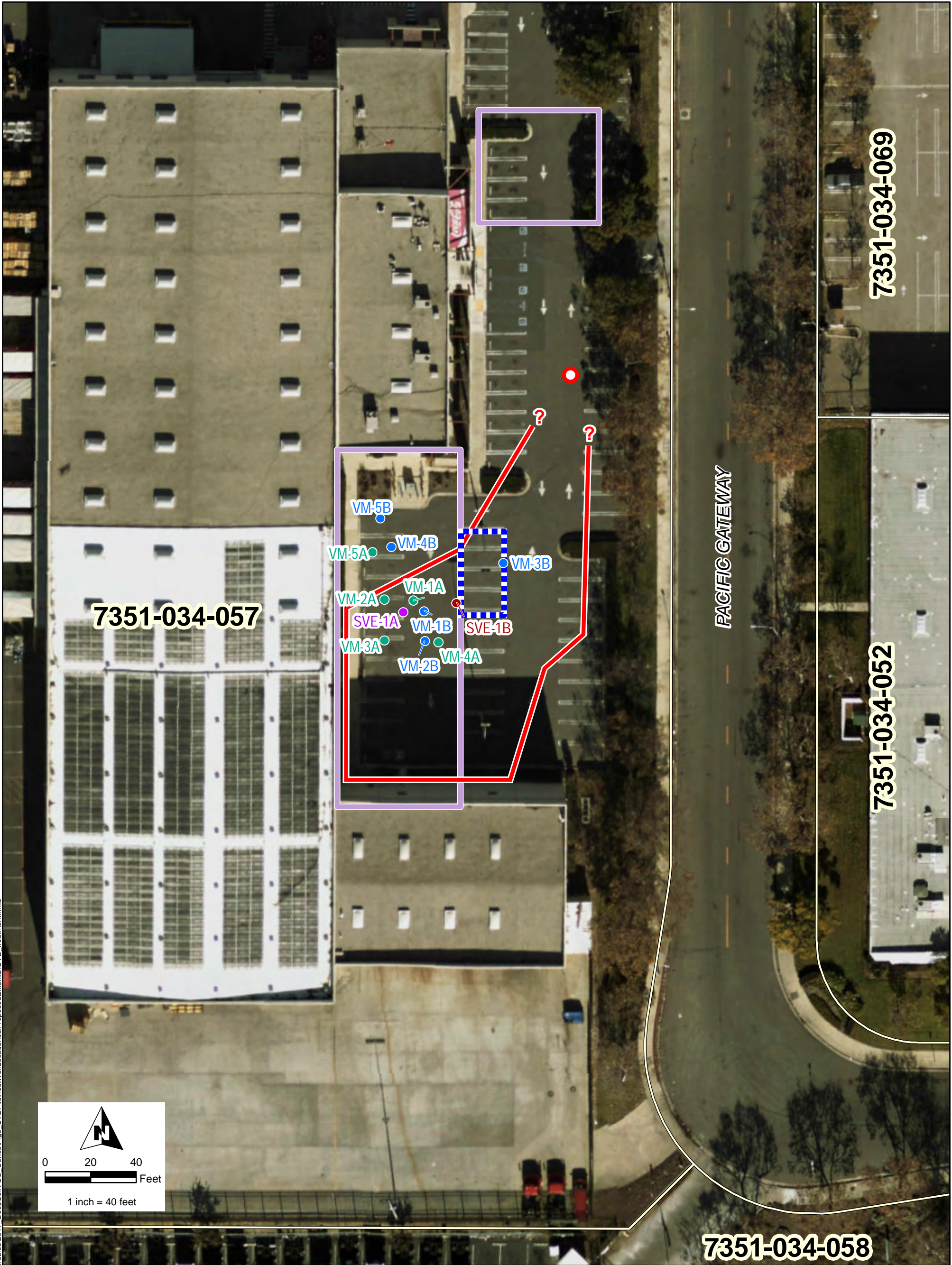


FIGURE 2

PROPERTY 23/SA-6
SVE REMEDIATION AREAS

SVE Pilot Test Report
Soil and NAPL Operable Unit – OU1
Del Amo Superfund Site



- Legend**
- Shallow soil extraction test well (connected to equipment)
 - Shallow soil monitoring well
 - Deep soil extraction test well (connected to equipment)
 - Deep soil monitoring well
 - Proposed Additional Deep Soil Boring
 - SVE Pilot Test Temporary Remediation Compound
 - ROD-identified potential shallow soil SVE area
 - Extent of SVE based on 2017 deep soil data and 2017 UVOST data
 - Assessor's parcel boundaries

Imagery Source: Esri World Imagery, Port of Long Beach 12/16/2017, 0.07 m resolution.

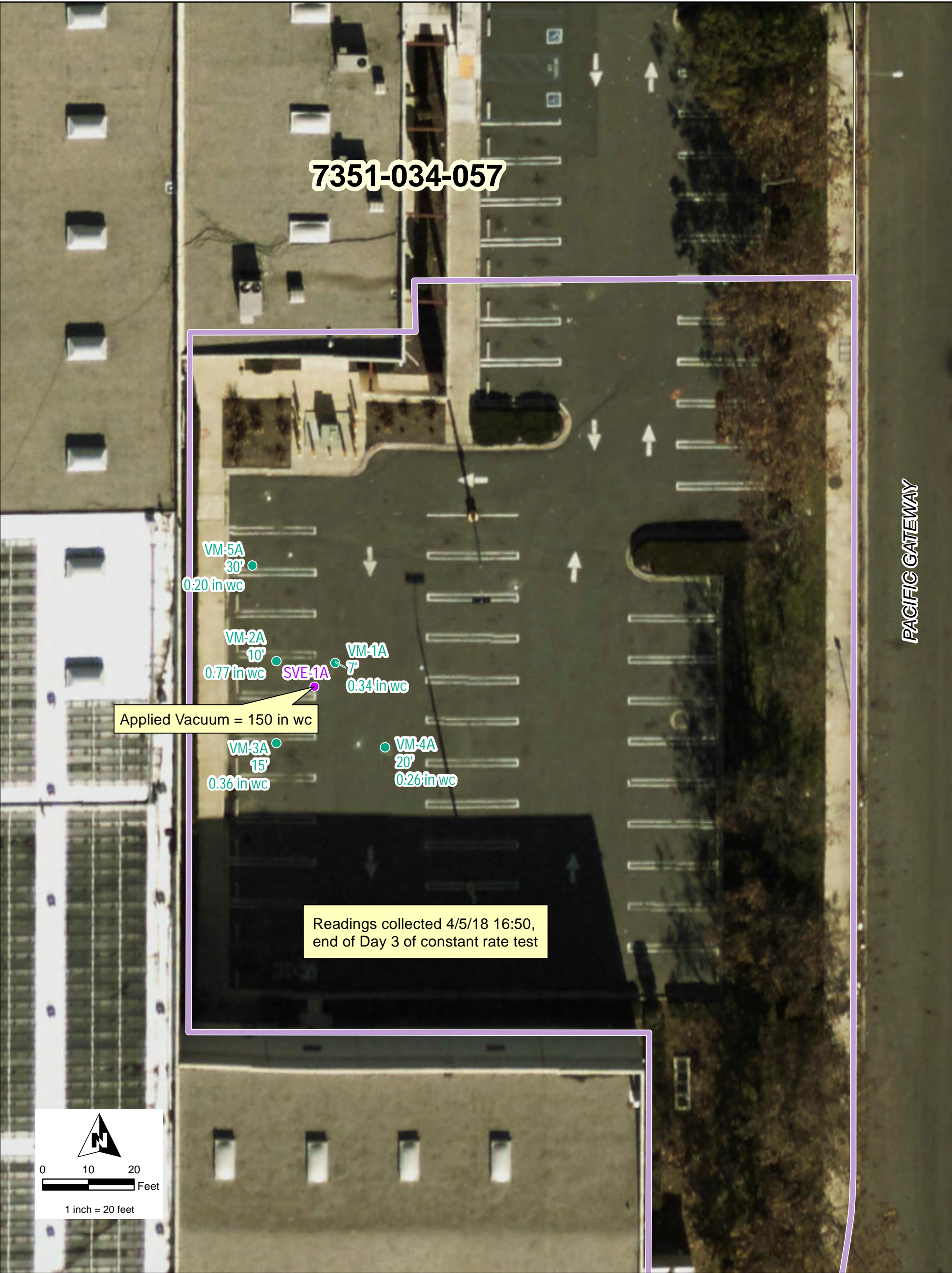
Figure 3

**SVE PILOT TEST WELL LOCATIONS
AND PROPOSED EXTENT OF SVE TREATMENT**

Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)
Del Amo Superfund Site

AECOM

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- Legend**
- Shallow soil extraction test well (connected to equipment)
 - Shallow soil monitoring well
 - ROD-identified potential deep soil SVE area
 - Assessor's parcel boundaries

Note: in wc = vacuum readings in inches of water.
Labels include Well ID, Distance to SVE-1A, and Vacuum influence reading.

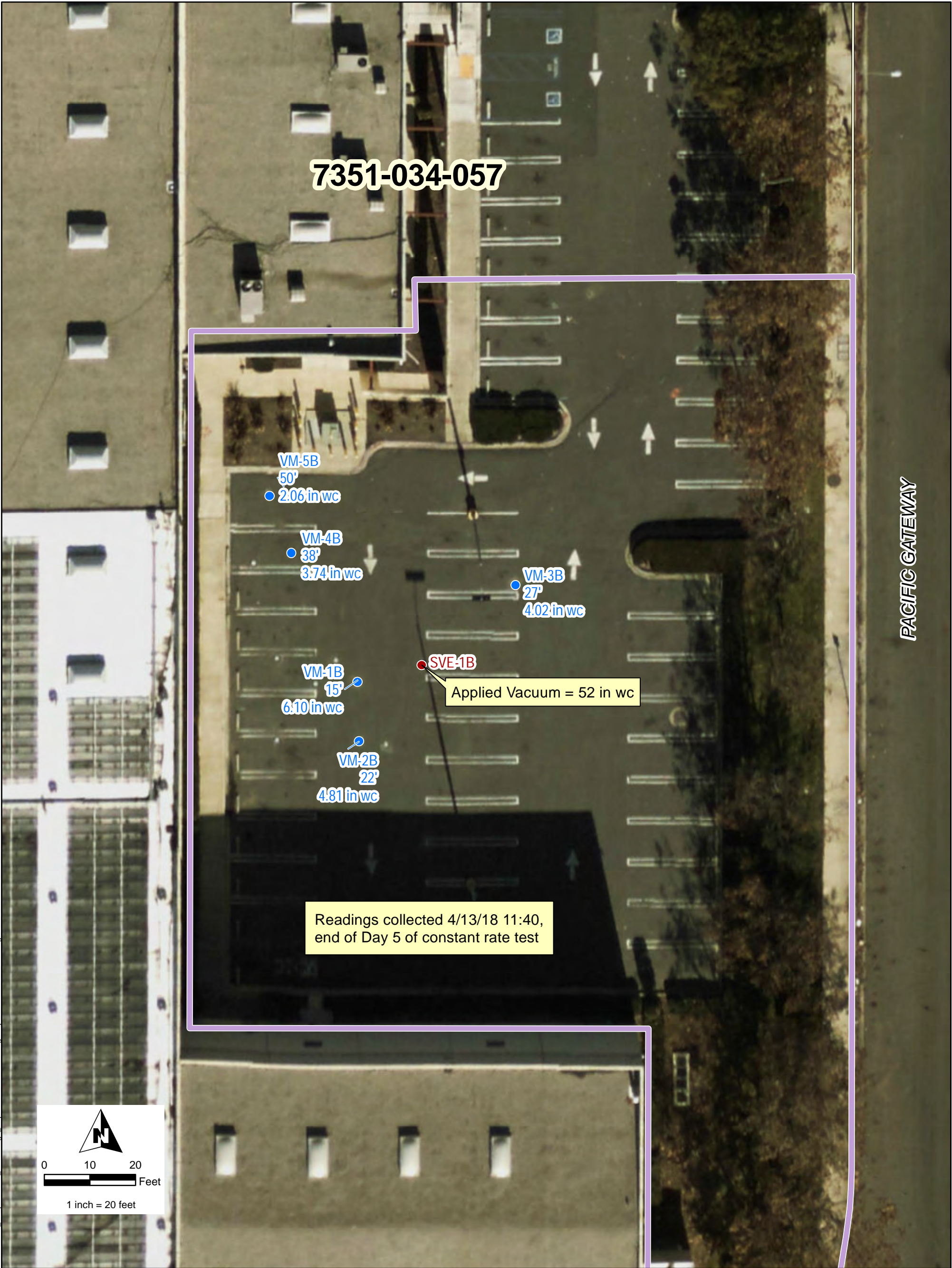
Imagery Source: Esri World Imagery, Port of Long Beach 12/16/2017, 0.07 m resolution.

Figure 4

**REPRESENTATIVE VACUUM INFLUENCE
DURING SHALLOW OUTDOOR
SOIL CONSTANT RATE TESTING**

Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)
Del Amo Superfund Site

AECOM



- Legend**
- Shallow soil extraction test well (connected to equipment)
 - Shallow soil monitoring well
 - Deep soil extraction test well (connected to equipment)
 - Deep soil monitoring well
 - ROD-identified potential deep soil SVE area
 - Assessor's parcel boundaries

Note: in wc = vacuum readings in inches of water.
Labels include Well ID, Distance to SVE-1B, and Vacuum influence reading.

Imagery Source: Esri World Imagery, Port of Long Beach 12/16/2017, 0.07 m resolution.

Figure 5

REPRESENTATIVE VACUUM INFLUENCE
DURING DEEP SOIL CONSTANT RATE TESTING

Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)
Del Amo Superfund Site

AECOM

FIGURE 6
Shallow Step Test SVE-1A; Flow Rate versus Wellhead Vacuum
SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

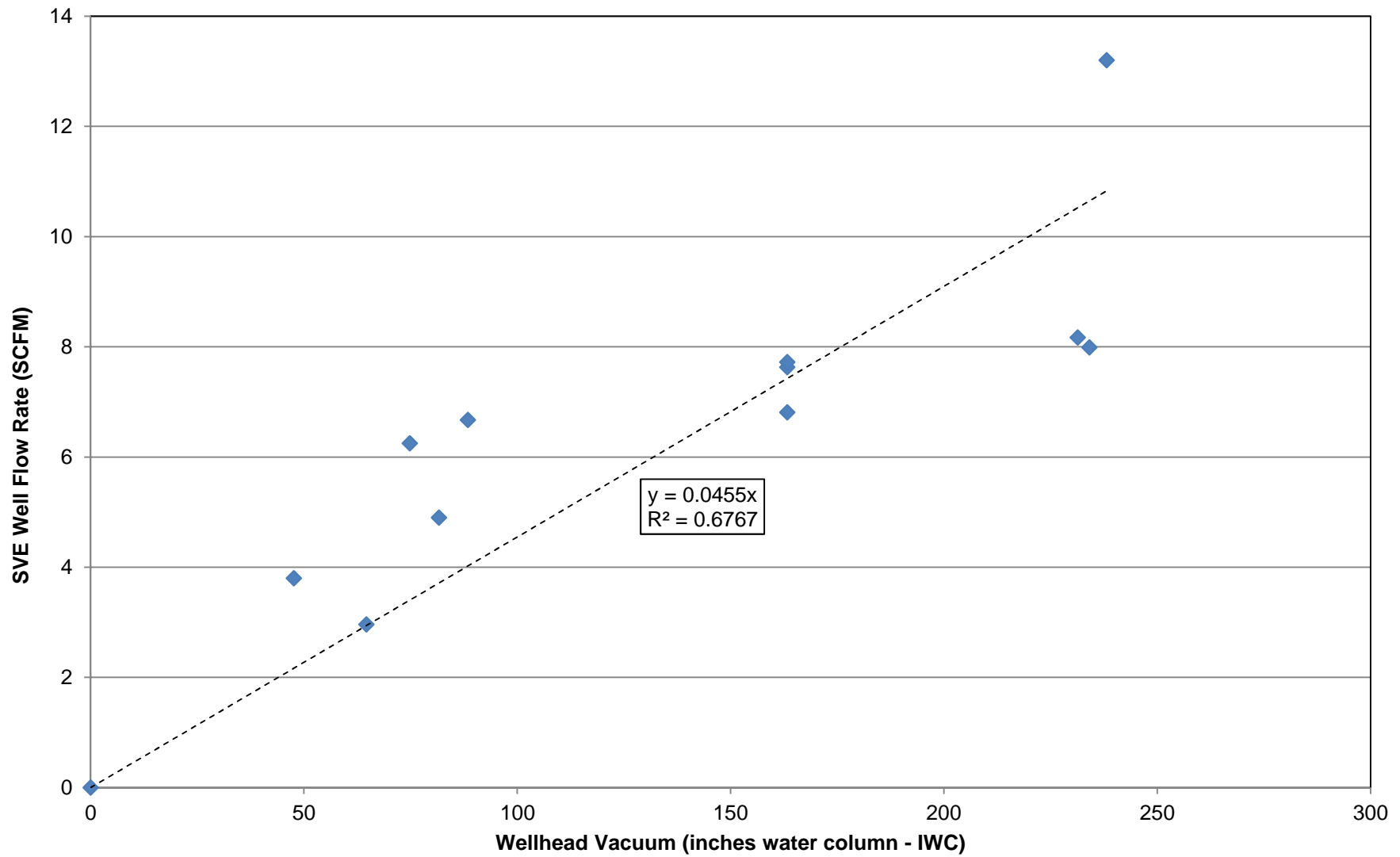
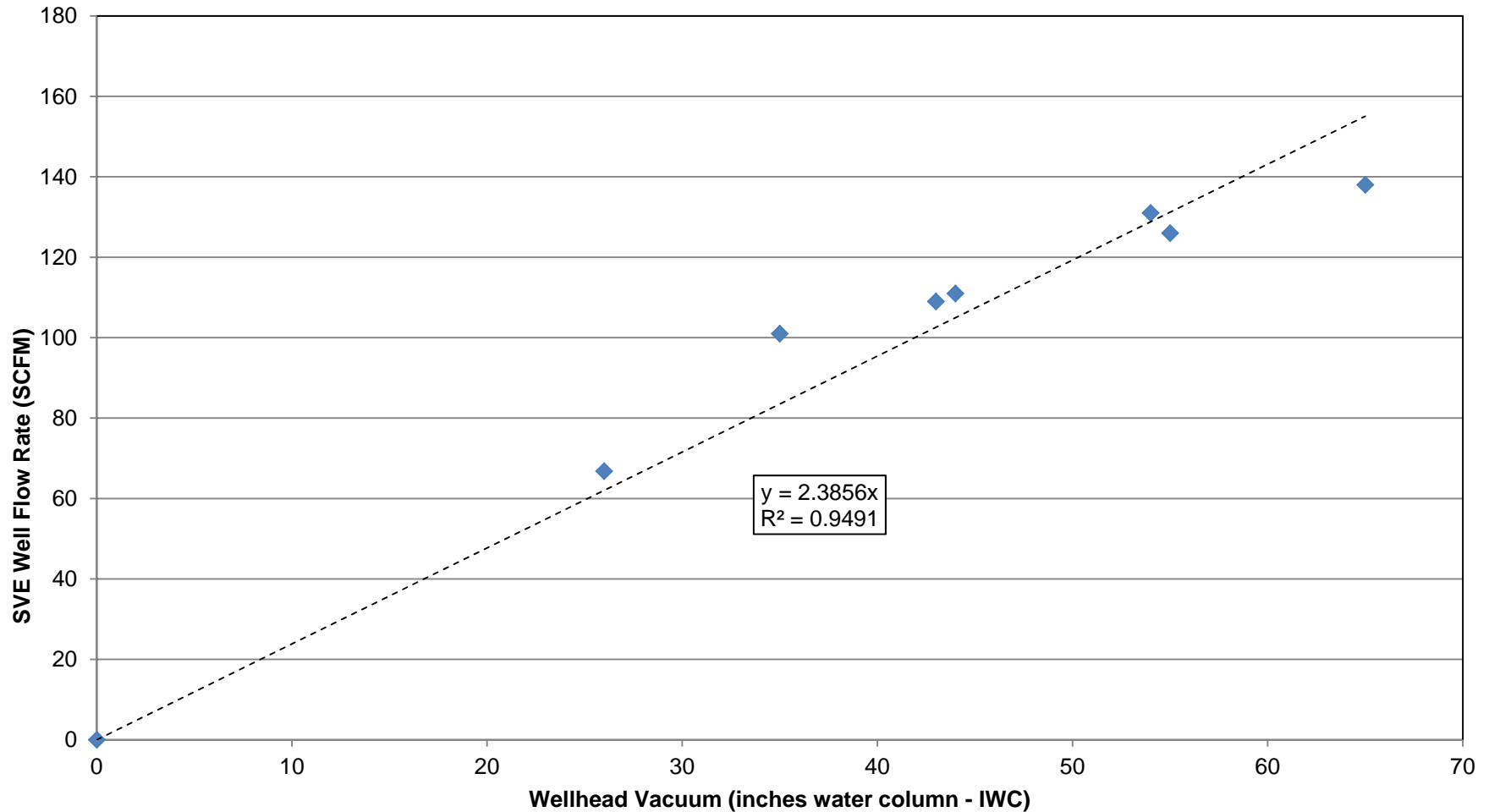


FIGURE 7
Deep Step Test SVE-1B; Flow Rate versus Wellhead Vacuum
SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)



Note: High wellhead flowrates measured by the VelociCalc during the deep soil pilot test were likely overestimated. Based on a mass balance with benzene and ethylbenzene concentrations (Attachment 6), the deep zone flow rates likely ranged between 40 and 79 scfm. However, the trend as presented in this figure likely remains the same.

FIGURE 8
Representative Shallow Zone ROI - Test Run #4: SVE-1A; end of day 2 constant rate test
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

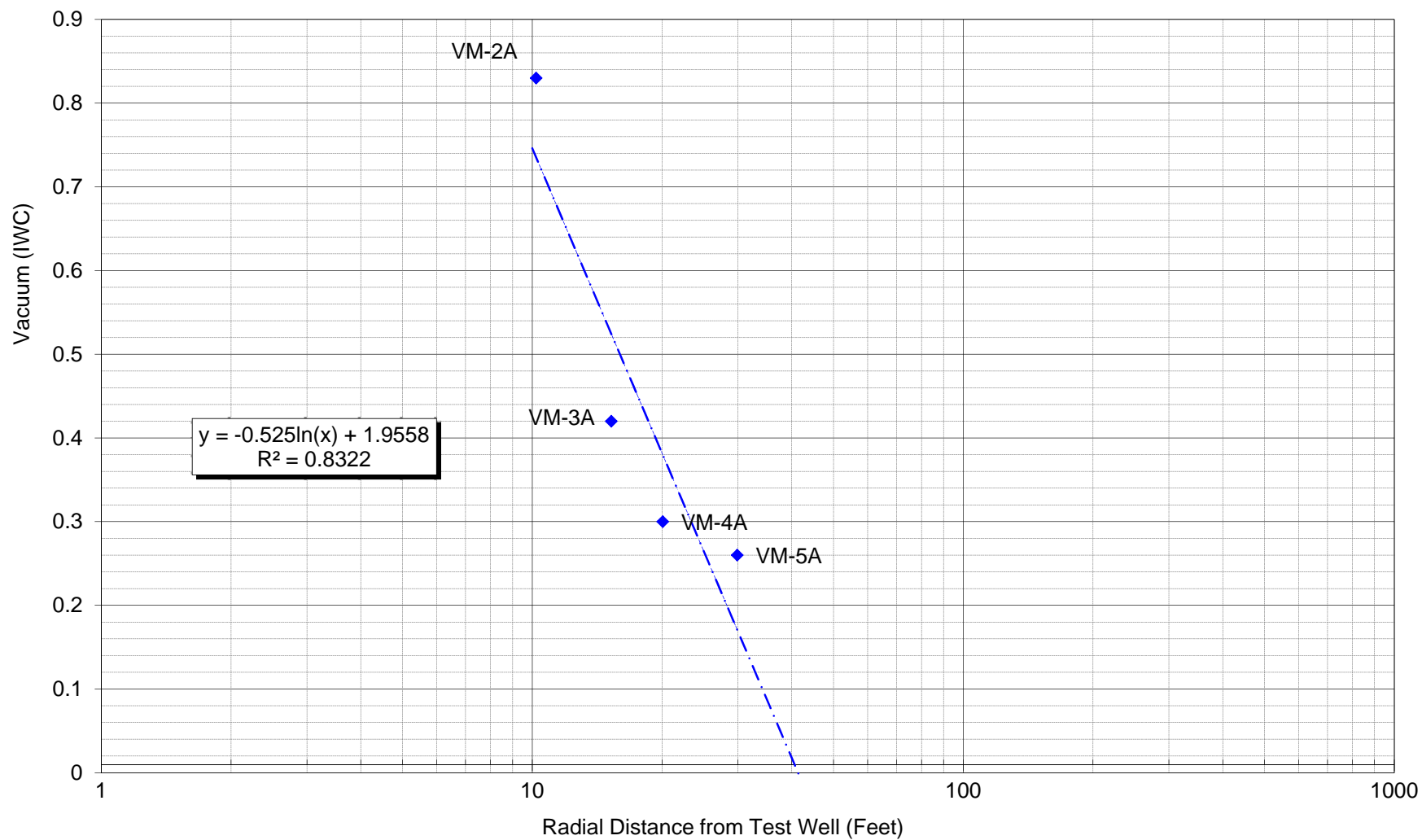


FIGURE 9
Representative Deep Zone ROI - Test Run #10: SVE-1B; end of day 3 constant rate test
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

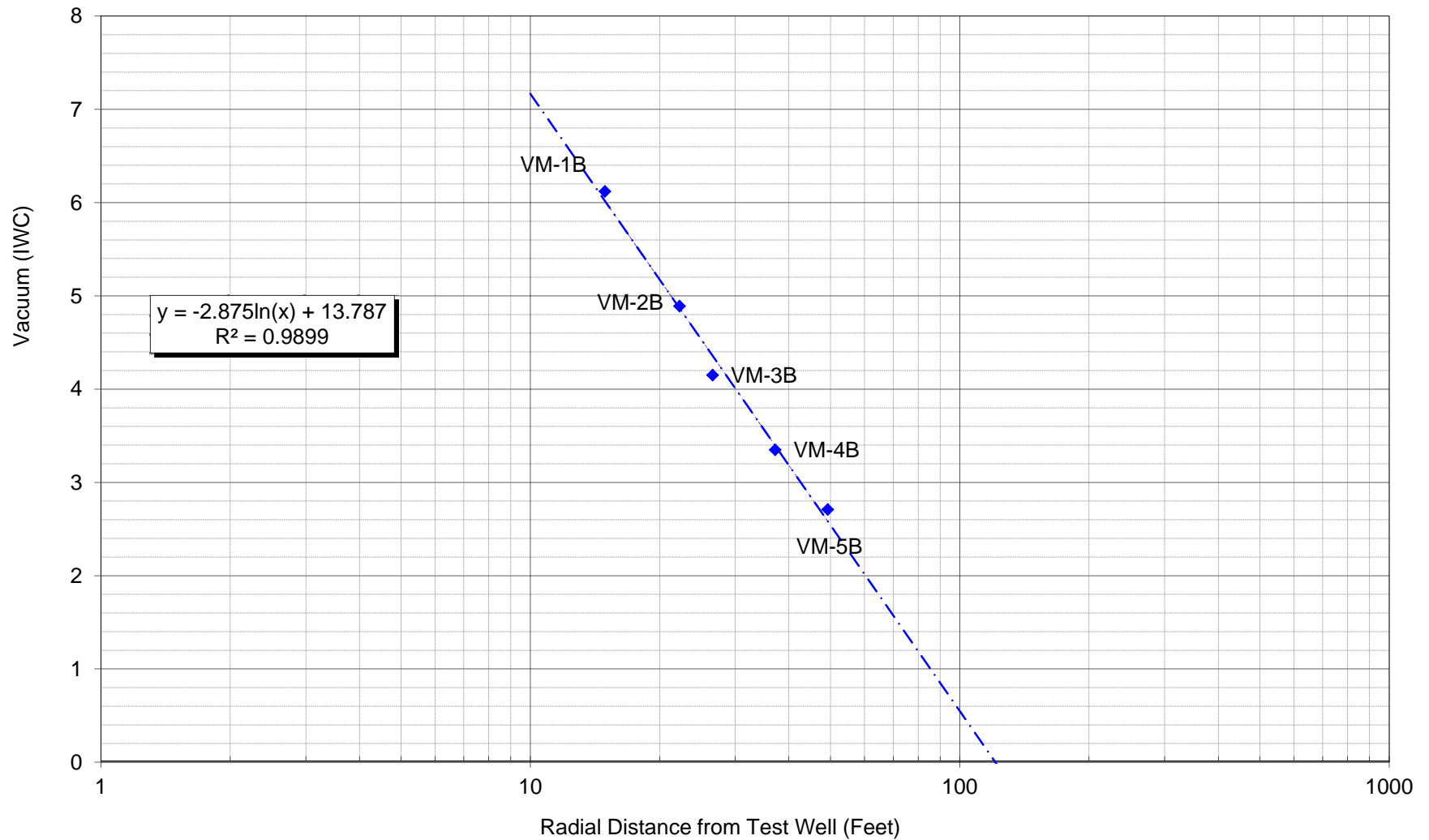
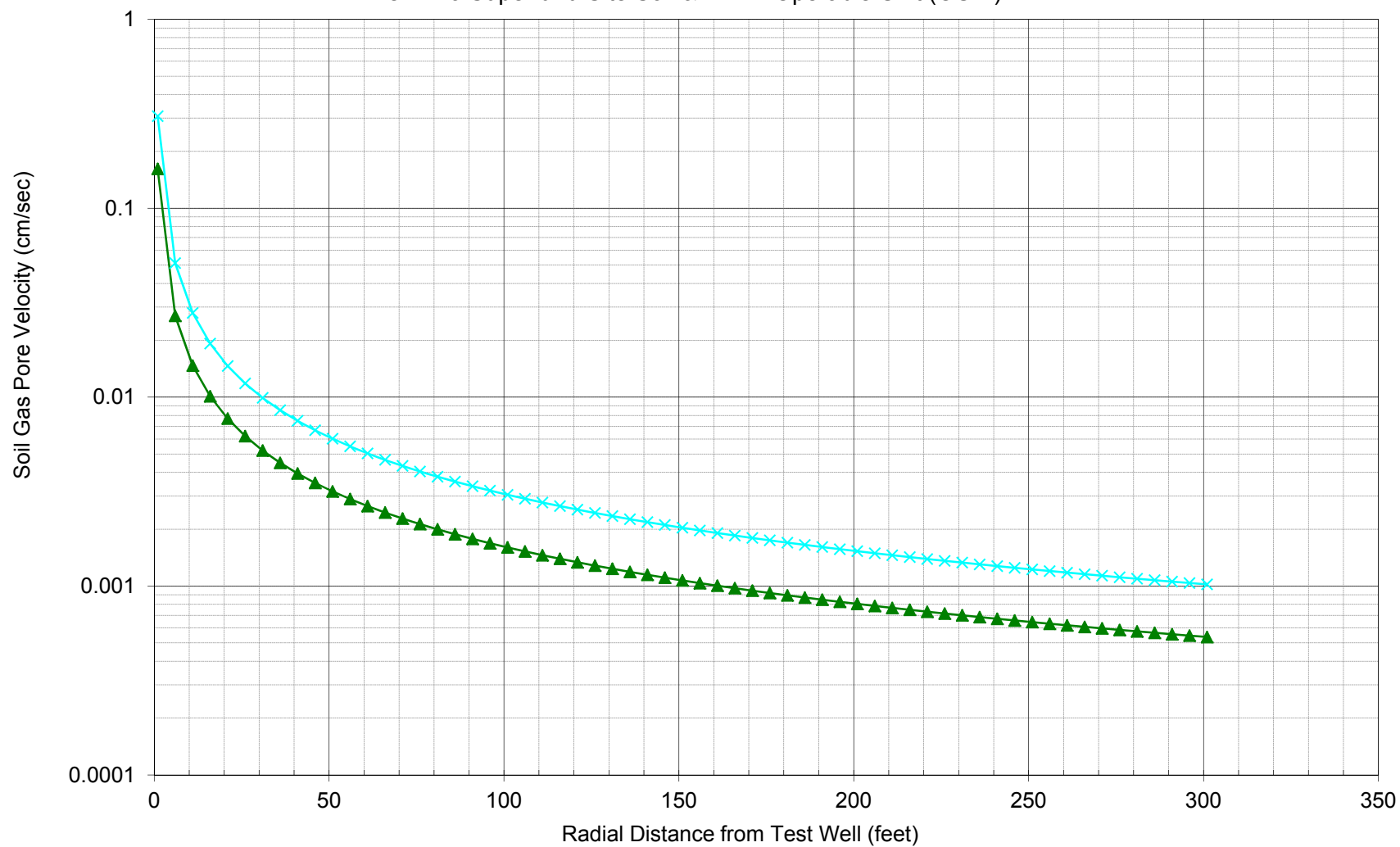


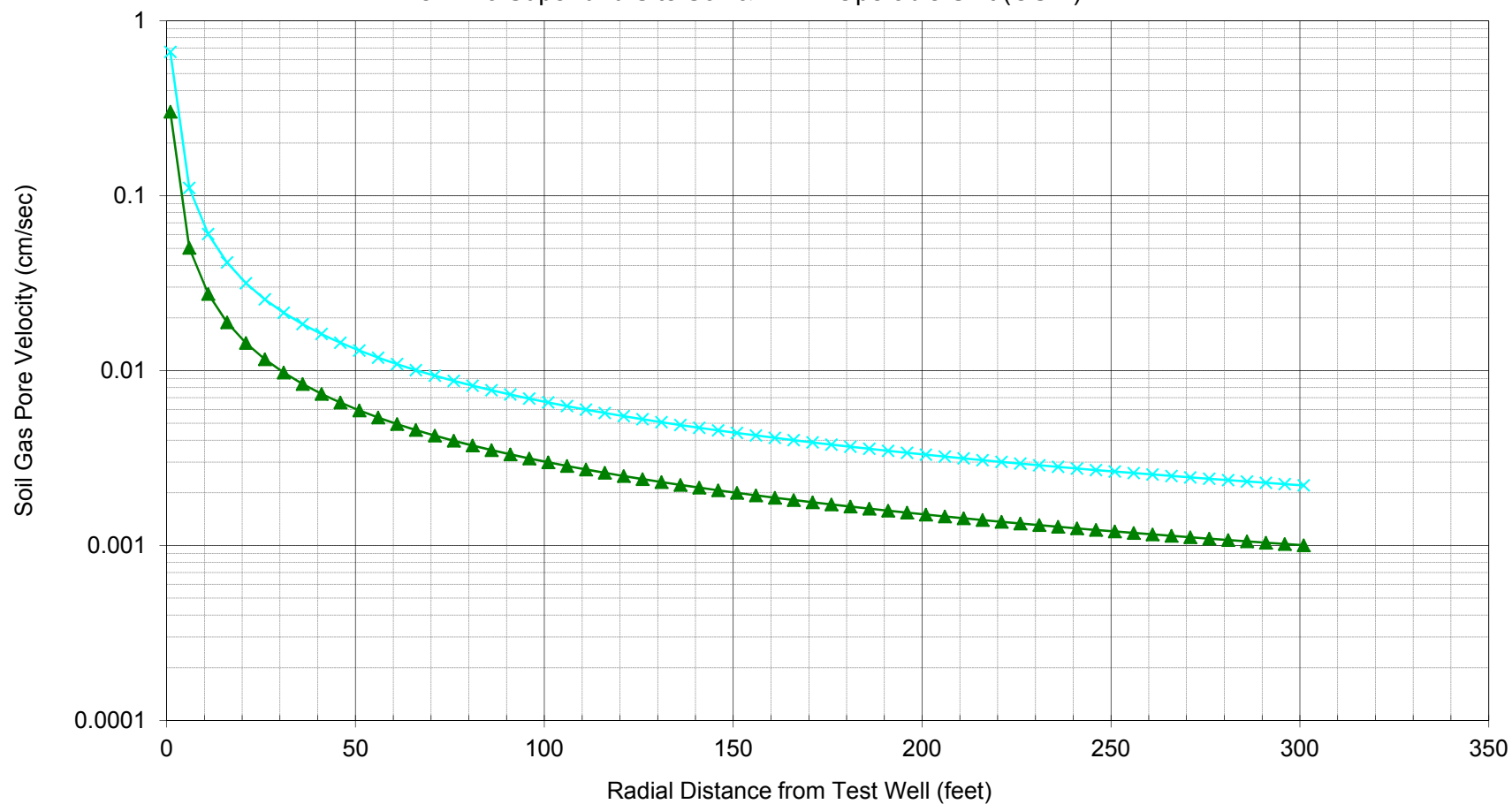
FIGURE 10
Soil Gas Pore Velocity versus Radial Distance from SVE-1A - Test Run #4: end of day 2 constant rate test
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); θ -total = 0.38

—x— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); θ -air = 0.2

FIGURE 11
Soil Gas Pore Velocity versus Radial Distance from SVE-1B - Test Run #10: end of day 3 constant rate test
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)



—▲ SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{total}} = 0.44$

—× SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{air}} = 0.2$

FIGURE 12
SOIL VAPOR CONCENTRATIONS AND MASS REMOVAL RATES
Shallow Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

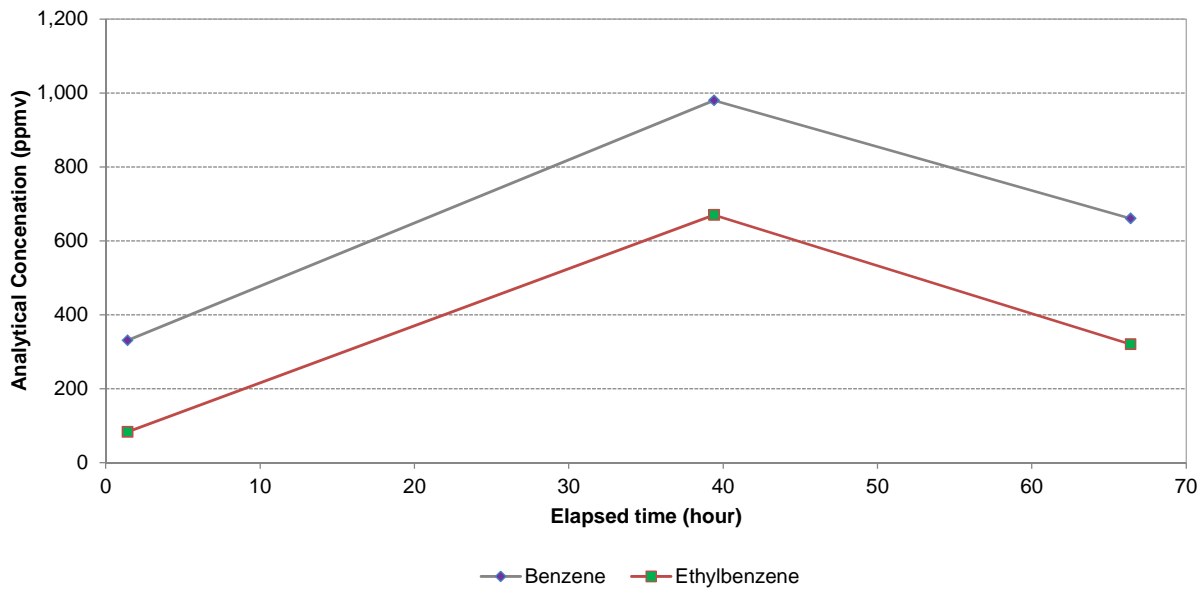
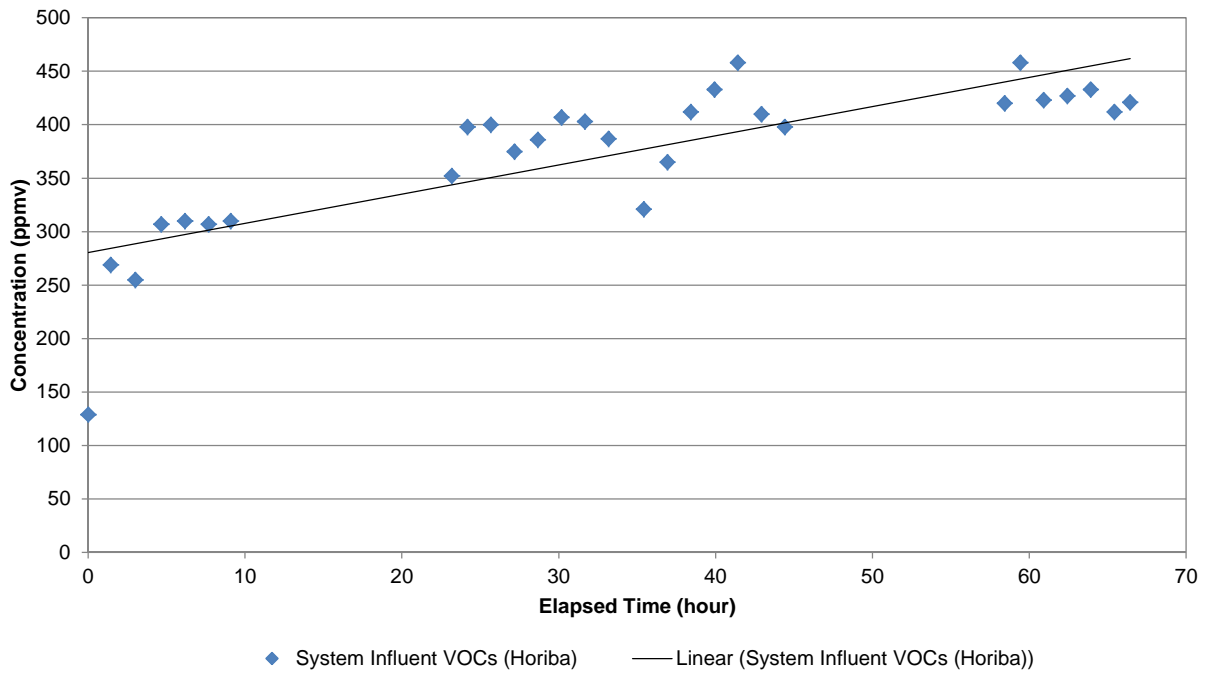
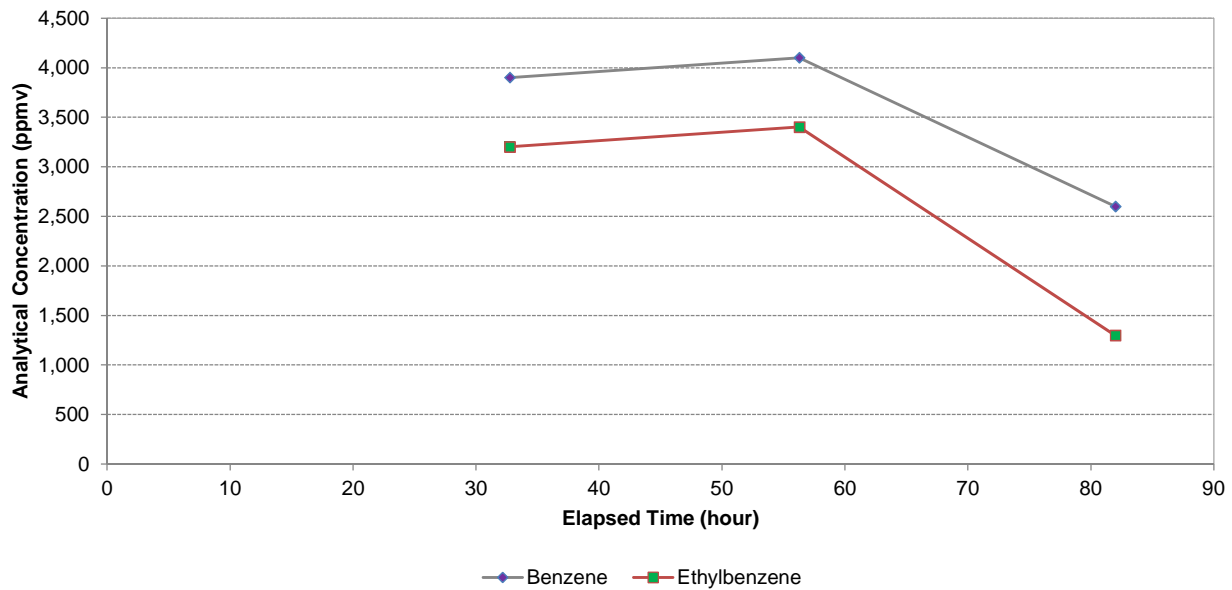
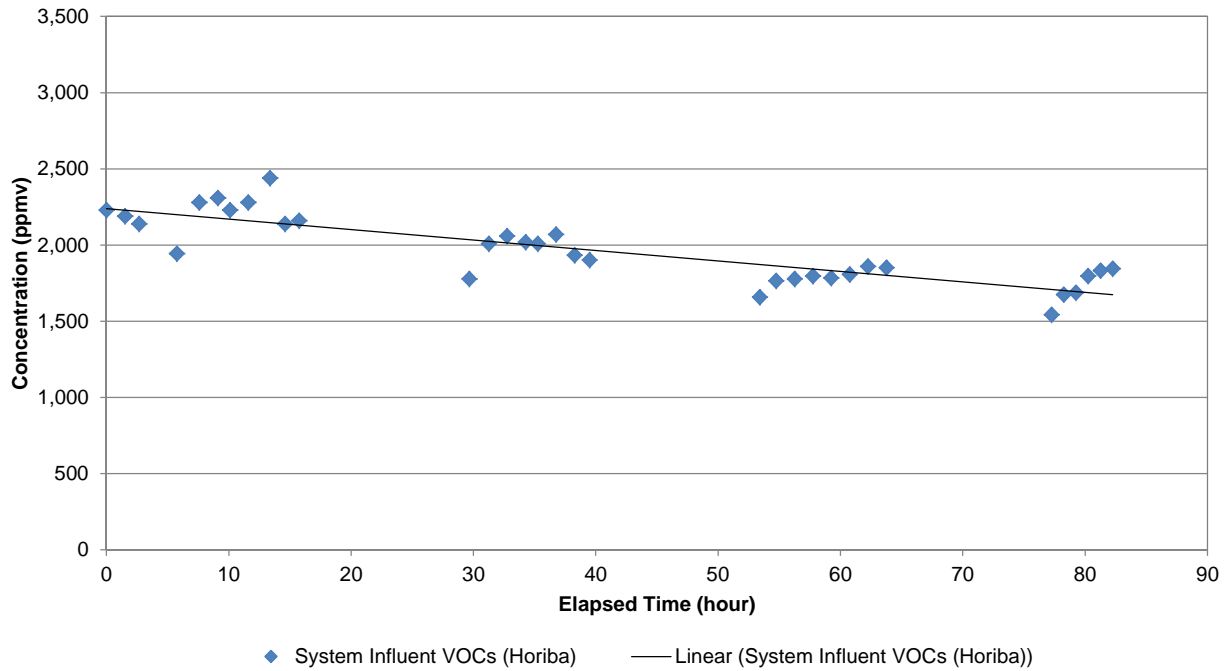
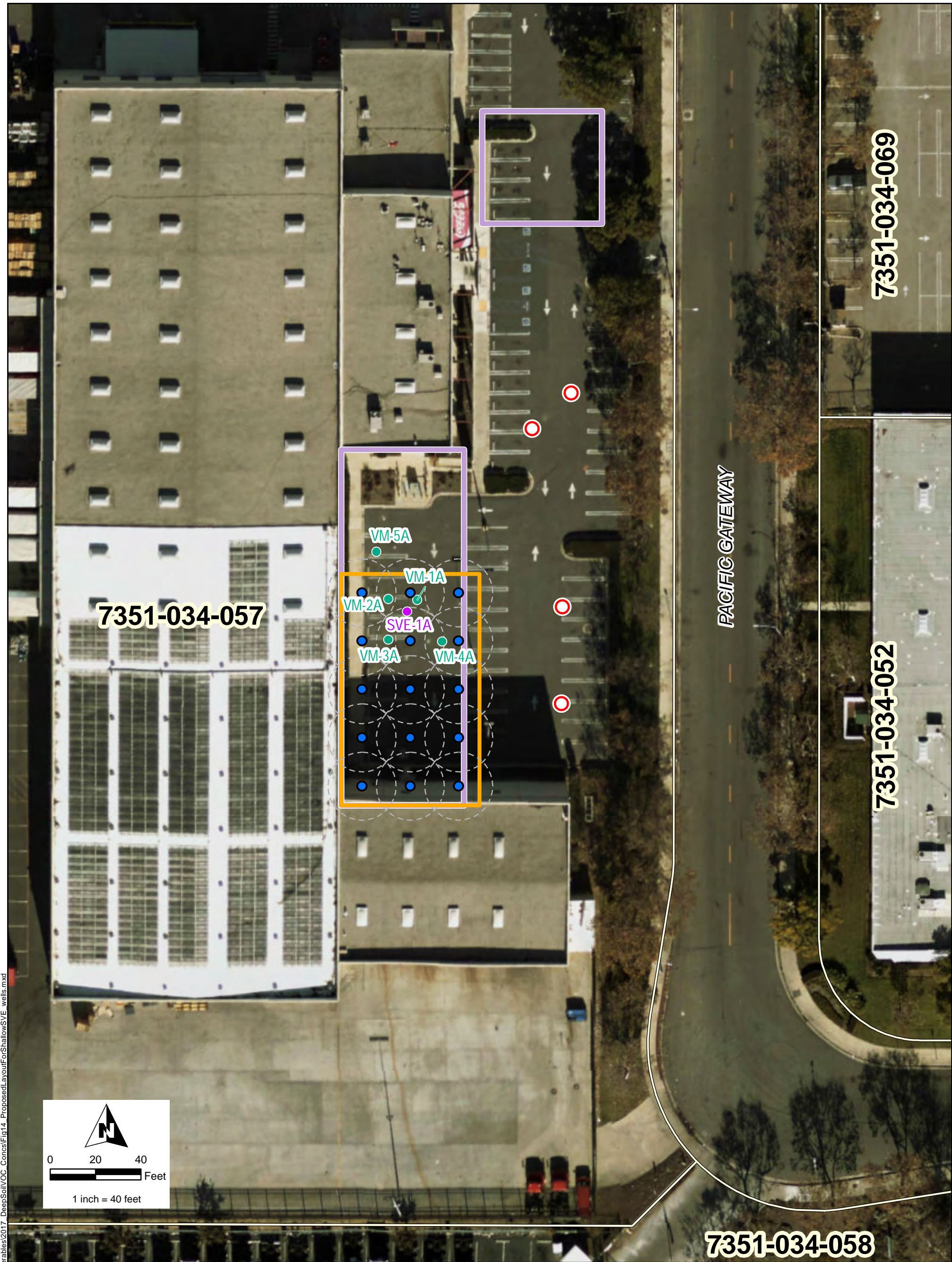


FIGURE 13
SOIL VAPOR CONCENTRATIONS AND MASS REMOVAL RATES
Deep Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)



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- Legend**
- Proposed Additional Shallow Soil Boring Location
 - Proposed shallow soil SVE well
 - Assumed shallow ROI of 15 ft
 - Shallow soil extraction test well (connected to equipment)
 - Shallow soil monitoring well
 - Proposed Shallow SVE Implementation Area
 - ROD-identified potential shallow soil SVE area
 - Assessor's parcel boundaries

Note: SVE wells will be spaced similarly (22 feet apart) in the northeast area once delineation is complete.

Imagery Source: Esri World Imagery, Port of Long Beach 12/16/2017, 0.07 m resolution.

Figure 14

PROPOSED LAYOUT FOR SHALLOW SVE WELLS

Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)
Del Amo Superfund Site

AECOM



- Legend**
- Proposed deep soil dual screen SVE well (new) / B screen: 19 to 31 ft bgs; and C screen: 35 to 43 ft bgs
 - Assumed deep vacuum ROI of 100 ft
 - Zone of high pore gas velocity
 - Soil Boring Location
 - Soil boring with previous high VOC concentrations
 - Deep soil monitoring well
 - Deep soil extraction test well (connected to equipment)
 - Proposed Additional Deep Soil Boring Location
 - Extent of SVE based on 2017 deep soil data and 2017 UVOST data
 - Assessor's parcel boundaries

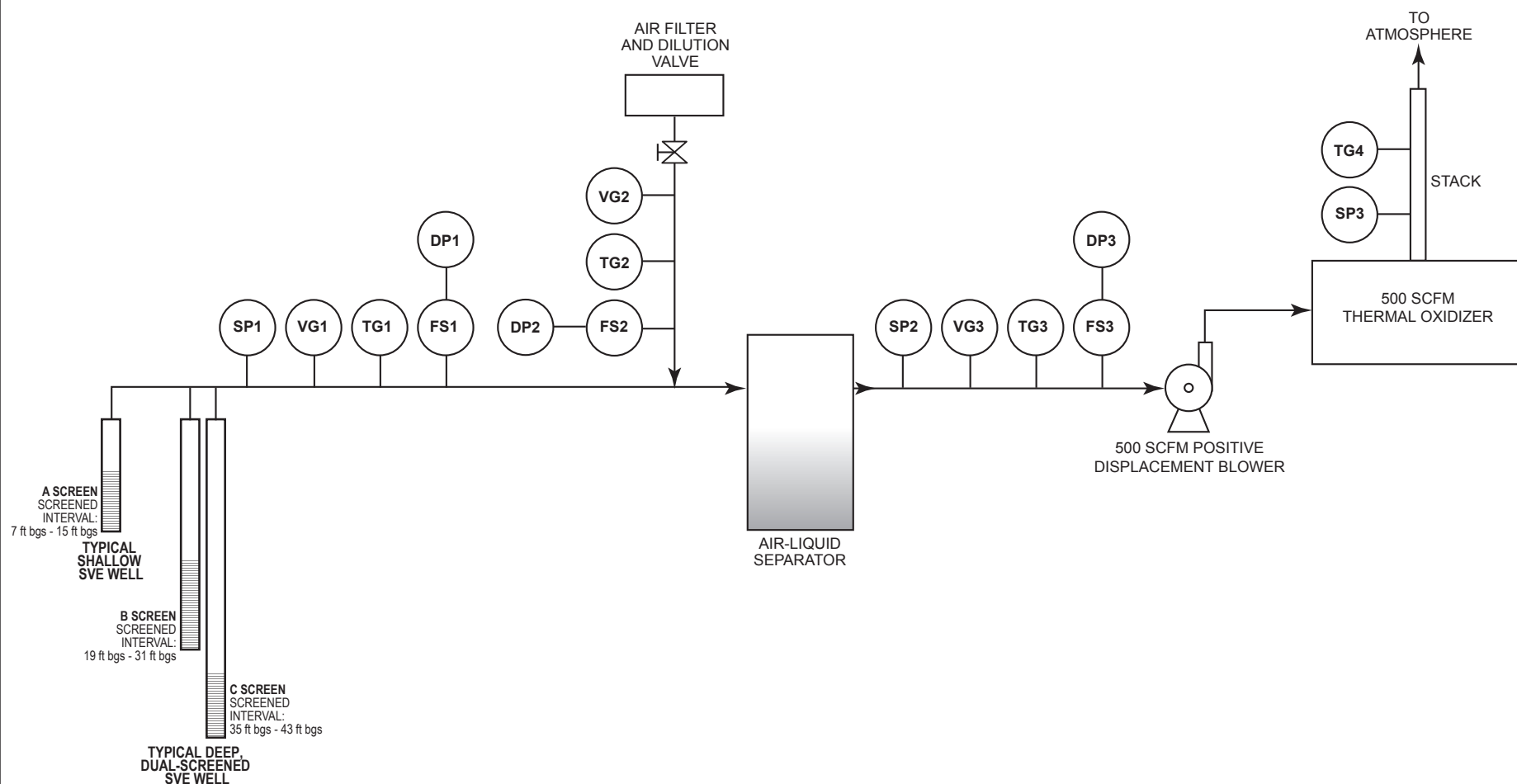
Imagery Source: Esri World Imagery, Port of Long Beach 12/16/2017, 0.07 m resolution.

Figure 15

PROPOSED LAYOUT FOR DEEP SVE WELLS

Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)
Del Amo Superfund Site





Legend

SP1	Well field sample port	DP2	Dilution differential pressure gauge
VG1	Well field vacuum gauge	SP2	Influent sample port
TG1	Well field temperature gauge	VG3	Influent vacuum gauge
FS1	Well field flow sensor	TG3	Influent temperature gauge
DP1	Well field differential pressure gauge	FS3	Influent flow sensor
VG2	Dilution vacuum gauge	DP3	Influent differential pressure gauge
TG2	Dilution temperature gauge	SP3	Effluent sample port
FS2	Dilution flow sensor	TG4	Effluent temperature gauge (combustion chamber only)

FIGURE 16

SVE SYSTEM PROCESS & INSTRUMENTATION DIAGRAM

SVE Pilot Test Report
Soil and NAPL Operable Unit - OU1
Del Amo Superfund Site

TABLES

Table 1 – SVE Pilot Testing Well Construction Details

Table 2 – Baseline Field Vacuum Measurements

Table 3 – VOC and Fixed Gas Soil Vapor Analytical Results – Shallow and Deep Testing

Table 4 – Shallow Zone Step Test – Wellhead and System Readings

Table 5 – Shallow Zone Step Test Vacuum Influence

Table 6 – Shallow Zone Constant Rate Testing System Readings

Table 7 – Shallow Zone Constant Rate Vacuum Influence

Table 8 – Deep Zone Step Testing System Readings

Table 9 – Deep Zone Step Test Vacuum Influence

Table 10 – Deep Zone Constant Rate Testing System Readings

Table 11 – Deep Zone Constant Rate Vacuum Influence

Table 12 – Dioxin/Furan SVE Emissions Sampling Results

Table 13 – Dioxin/Furan Background/Ambient Air Sampling Results

TABLE 1
SVE PILOT TEST WELL CONSTRUCTION DETAILS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Well ID (Soil Boring ID)	Type	Zone	Date Installed	Total Depth (feet bgs)	Diameter of Casing (inches)*	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Sand Filter Pack (feet bgs)	Approximate Distance from Extraction Well (feet)
SVE-1A (VWL0011)	Extraction	Shallow	5/24/2017	16	2	7	15	6 - 16	From SVE-1A:
VM-1A (VWL0012)	Vapor monitoring	Shallow	5/25/2017	16	2	7	15	6 - 16	7
VM-2A (VWL0013)	Vapor monitoring	Shallow	5/25/2017	16	2	7	15	6 - 16	10
VM-3A (VWL0014)	Vapor monitoring	Shallow	5/25/2017	16	2	7	15	6 - 16	15
VM-4A (VWL0015)	Vapor monitoring	Shallow	5/24/2017	16	2	7	15	6 - 16	20
VM-5A (VWL0016)	Vapor monitoring	Shallow	5/24/2017	16	2	7	15	6 - 16	30
SVE-1B (VWL0017)	Extraction	Deep	5/24/2017	43	2	20	42	18.5 - 43	From SVE-1B:
VM-1B (VWL0018)	Vapor monitoring	Deep	5/25/2017	43	2	20	42	18.5 - 43	15
VM-2B (VWL0019)	Vapor monitoring	Deep	5/25/2017	43	2	20	42	18.5 - 43	22
VM-3B (VWL0020)	Vapor monitoring	Deep	5/25/2017	43	2	19	41	18.5 - 43	27
VM-4B (VWL0021)	Vapor monitoring	Deep	5/24/2017	43	2	20	42	18.5 - 43	38
VM-5B (VWL0016)	Vapor monitoring	Deep	5/24/2017	43	2	20	42	18.5 - 43	50

Notes:

bgs = below ground surface

*Well casing is 2" Blank Schedule 40 PVC

Screen is 0.020 inch slotted 2 inch Schedule 40 PVC

TABLE 2
BASELINE FIELD VACUUM MEASUREMENTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Well ID	Zone	Date Measured	Vacuum (in wc)
<i>Prior to start of pilot testing</i>			
SVE-1A	Shallow	4/2/18 10:35	0.000
VM-1A	Shallow	4/2/18 11:05	0.000
VM-2A	Shallow	4/2/18 11:25	0.000
VM-3A	Shallow	4/2/18 10:45	0.000
VM-4A	Shallow	4/2/18 10:55	0.000
VM-5A	Shallow	4/2/18 11:15	0.000
SVE-1B	Deep	4/2/18 10:28	0.000
VM-1B	Deep	4/2/18 9:45	0.100
VM-2B	Deep	4/2/18 9:55	0.080
VM-3B	Deep	4/2/18 10:20	0.000
VM-4B	Deep	4/2/18 10:15	0.065
VM-5B	Deep	4/2/18 10:05	0.080
<i>Post shallow testing; Prior to start of deep testing*</i>			
SVE-1B	Deep	4/9/18 7:00	0.065
VM-1B	Deep	4/9/18 8:05	0.075
VM-2B	Deep	4/9/18 8:03	0.080
VM-3B	Deep	4/9/18 8:12	0.070
VM-4B	Deep	4/9/18 8:10	0.085
VM-5B	Deep	4/9/18 8:08	0.075

Notes:

in wc = inches of water column

* Readings collected after equilibrium period

TABLE 3
VOC AND FIXED GAS SOIL VAPOR ANALYTICAL RESULTS – Shallow and Deep Testing
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Study	Sample Location	Sample ID	Sample Date	Time	Benzene	Ethylbenzene	Toluene	Acetone	Carbon Disulfide	Dichlorodifluo romethane	4- Ethyltoluene	o-Xylene	p/m-Xylene	Styrene	Tetrachloro ethene	Trichloroeth ene	Methane	Carbon Dioxide	Nitrogen	Oxygen (+ Argon)	TPH (as Gasoline)	
					ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	%v	%v	%v	ppmv	
Analytical Method					EPA TO-15M												SCAQMD 25.1M	ASTM D-1946			EPA TO-3M	
Baseline - Shallow		SVE-1A	VSS01351	04/02/18	1035	6,800	1,700	78 J	40 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	<3.5	290	7.48	89.1	3.47	13,000
Baseline - Deep		SVE-1B	VSS01350	04/02/18	1028	7,600	1,900	92 J	51 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	<3.5	360	15.5	81.9	2.62	12,000
Shallow Zone																						
Shallow Step Test; Step 1		SVE-1A	VSS01355	04/02/18	1255	5,400	1,700	67 J	34 J	<11	<2.4	<6.4	<6.3	<13	<2.5	<2.7	<2.8	270	5.52	87.6	6.91	9,100
		Influent	VSS01352	04/02/18	1301	120	11	0.90 J	0.42 J	<0.089	<0.019	<0.051	<0.050	<0.11	<0.020	<0.022	<0.022	9	0.220 J	78.9	20.9	170
Shallow Step Test; Step 2		SVE-1A	VSS01357	04/02/18	1339	7,100	2,700	100 J	34 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	<3.5	310	6.52	89.1	4.33	13,000
		Influent	VSS01360	04/02/18	1353	81	9	1.3	0.22 J	<0.028	0.015 J	<0.016	<0.016	<0.033	0.0080 J	<0.0067	<0.0069	10	0.204 J	78.8	21	260
Shallow Step Test; Step 3		SVE-1A	VSS01353	04/02/18	1450	7,800	3,200	110 J	36 J	<17	<3.7	<9.9	<9.8	<21	<4.0	<4.2	<4.3	320	6.77	89.1	4.17	14,000
		Influent	VSS01354	04/02/18	1453	380	47	3.2 J	<0.72	<0.70	<0.15	<0.40	<0.39	<0.83	<0.16	<0.17	<0.17	20	0.434 J	79.2	20.3	630
Shallow Step Test; Step 4		SVE-1A	SVE-1A sample not collected as high system vacuum could not be overcome by sample box																			
		Influent	VSS01358	04/02/18	1606	580	180	5.9	<0.23	<0.22	<0.048	<0.13	<0.13	<0.27	0.092 J	<0.054	<0.056	24	0.559	79.3	20.1	1,000
Shallow Step Test; End		SVE-1A	VSS01359	04/02/18	1707	3,700	930	25	<0.029	0.036 J	0.015 J	0.11	0.17	0.5	0.77	<0.0067	<0.0069	300	7.17	88.3	4.54	12,000
		Influent	VSS01356	04/02/18	1701	710	300	10 J	<1.1	<0.24	<0.64	<0.63	<1.3	<0.25	<0.27	<0.28	29	0.747	79.5	19.7	1,400	
Shallow Constant Rate Test; Initial Hour 1.4		SVE- 1A	VSS01361	04/03/18	916	4,200	970	62	12 J	<2.8	1.5 J	<1.6	<1.6	<3.3	0.94 J	<0.67	<0.69	300	8.16	88	3.86	15,000
		Influent	VSS01363	04/03/18	915	330	83	4.6	<0.11	<0.11	<0.024	<0.064	<0.063	<0.13	0.11 J	<0.027	<0.028	19	0.506	79.1	20.4	890
		Effluent	VSS01362	04/03/18	918	0.8	1.3	0.029	0.021 J	<0.0011	<0.00024	0.00098 J	0.00098 J	0.0024 J	0.0023 J	<0.00027	<0.00028	--	--	--	--	12
Shallow Constant Rate Test; Midpoint Hour 39.4		SVE- 1A	VSS01365	04/05/18	1201	7,600	1,900	87 J	<23	<22	<4.8	<13	<13	<27	<5.1	<5.4	<5.6	260	11	83.4	5.63	13,000
		Influent	VSS01366	04/05/18	1200	980	670	20 J	16 J	<2.8	<0.60	<1.6	<1.6	<3.3	0.97 J	<0.67	<0.69	26	1.19	79	19.8	1,700
		Effluent	VSS01367	04/05/18	1205	1.3	2.2	0.033 J	0.042 J	<0.0070	<0.0015	<0.0040	<0.0039	<0.0083	<0.0016	<0.0017	<0.0017	--	--	--	--	7
Shallow Constant Rate Test; Final Hour 66.4		SVE-1A	VSS01368	04/06/18	1455	7,600	3,000	110 J	<23	<22	<4.8	<13	<13	<27	<5.1	<5.4	<5.6	250	12.4	82.7	4.93	19,000
		Influent	VSS01369	04/06/18	1500	660	320	13 J	31 J	<2.8	<0.60	<1.6	<1.6	<3.3	<0.64	<0.67	<0.69	23	1.18	78.9	19.9	1,600
		Effluent	VSS01370	04/06/18	1505	0.9	1.6	0.027 J	0.0059 J	<0.0056	<0.0012	<0.0032	<0.0031	<0.0067	<0.0013	<0.0013	<0.0014	--	--	--	--	8
Deep Zone																						
Deep Step Test; Step 1		SVE-1B	VSS01372	04/09/18	833	8,700	2,800	74 J	<36	<35	<7.4	<20	<20	<42	<8.0	<8.4	<8.7	290	16.3	81.2	2.42	17,000
		Influent	VSS01371	04/09/18	835	3,600	1,100	39 J	21 J	<11	<2.4	<6.4	<6.3	<13	<2.5	<2.7	<2.8	120	6.44	79.5	14.1	5,700
Deep Step Test; Step 2		SVE-1B	VSS01374	04/09/18	1005	8,900	3,000	82 J	<46	<44	<9.5	<25	<25	<53	<10	<11	<11	290	16.1	81.4	2.55	19,000
		Influent	VSS01373	04/09/18	1005	3,100	870	49	1.3 J	<0.22	<0.048	0.37 J	0.20 J	0.38 J	0.16 J	<0.054	<0.056	130	7.29	79.6	13.1	9,400
Deep Step Test; Step 3		SVE-1B	VSS01376	04/09/18	1220	7,700	2,200	65 J	48 J	<44	<9.5	<25	<25	<53	<10	<11	<11	280	15.9	81.5	2.53	18,000
		Influent	VSS01375	04/09/18	1225	5,700	2,700	56 J	<29	<28	<6.0	<16	<16	<33	<6.4	<6.7	<6.9	200	9.86	80.2	9.95	12,000
Deep Step Test; Step 4		SVE-1B	VSS01378	04/09/18	1317	6,900	2,700	60 J	<46	<44	<9.5	<25	<25	<53	<10	<11	<11	350	15.8	81.6	2.61	19,000
		Influent	VSS01377	04/09/18	1315	5,100	2,600	55 J	30 J	<22	<4.8	<13	<13	<27	<5.1	<5.4	<5.6	170	8.66	79.9	11.4	11,000
Deep Step Test; End		SVE-1B	VSS01380	04/09/18	1420	8,300	3,000	70 J	<46	<44	<9.5	<25	<25	<53	<10	<11	<11	330	16	81.4	2.61	18,000
		Influent	VSS01379	04/09/18	1415	4,600	2,100	44 J	40 J	<22	<4.8	<13	<13	<27	<5.1	<5.4	<5.6	130	8.34	79.8	11.8	11,000
Deep Constant Rate Test; Initial Hour 1.5		SVE-1B	VSS01381	04/09/18	1615	7,900	2,700	63 J	<46	<44	<9.5	<25	<25	<53	<10	<11	<11	250	15.9	81.1	3.04	17,000
		Influent**	VSS01383	04/09/18	1625	33	82	1.0 J	0.53 J	<0.17	<0.037	<0.099	<0.098	<0.21	<0.040	<0.042	<0.043	--	--	--	--	170
		Effluent	VSS01382	04/09/18	1620	17	39	0.53 J	0.35 J	<0.11	<0.024	<0.064	<0.063	<0.13	<0.025	<0.027	<0.028	0.82 J	<0.139	78.5	21.4	110
Deep Constant Rate Test; Midpoint Hour 32.75		SVE-1B	VSS01384	04/11/18	1028	7,500	4,800	85 J	<29	<28	<6.0	<16	<16	<33	<6.4	<6.7	<6.9	270	14.9	78.8	6.29	16,000
		Influent	VSS01385	04/11/18	1025	3,900	3,200	50 J	14 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	9.3 J	130	7.48	78.6	14	8,900
		Effluent	VSS01386	04/11/18	1030	81*	310*	2.4 J	<1.1	<1.1	<0.24	<0.64	<0.63	<1.3	<0.25	<0.27	<0.28	--	--	--	--	570
Deep Constant Rate Test; Midpoint Hour 56.3		SVE-1B	VSS01387	04/12/18	1000	7,200	5,900	87 J	<29	<28	<6.0	<16	<16	<33	<6.4	<6.7	<6.9	140	14.4	78	7.55	15,000
		Influent	VSS01388	04/12/18	1000	4,100	3,400	54 J	18 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	4.0 J	76	7.62	78.2	14.2	8,500
		Effluent	VSS01389	04/12/18	1005	64*	130*	1.7 J	<0.46	<0.44	<0.095	<0.25	<0.25	<0.53	<0.10	<0.11	0.11 J	--	--	--	--	540
Deep Constant Rate Test; Final Hour 82		SVE-1B	VSS01390	04/13/18	1145	4,800	1,900	43 J	29 J	<28	<6.0	<16	<16	<33	<6.4	16 J	<6.9	82	13.8	77.8	8.4	15,000
		Influent	VSS01392	04/13/18	1156	2,600	1,300	25 J	20 J	<14	<3.0	<7.9	<7.8	<17	<3.2	<3.4	<3.5	45	7.09	78.1	14.8	8,900
		Effluent	VSS01391	04/13/18	1151	19	39	0.50 J	0.36 J	<0.11	<0.024	<0.064	<0.063	<0.13	<0.025	0.029 J	<0.028	--	--	--	--	220

Notes:
ppmv = parts per million by volume
%v = percent volume
TPH = total petroleum hydrocarbons
< = not detected above the method detection limit
-- = sample not collected per *RD Work Plan Sampling and Analytical Plan* (AECOM 2018)
J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
Only detected compounds are presented. For a complete list of compounds that are analyzed for by EPA TO-15M, please refer to Attachment 4.
*Elevated due to higher throughput of hydrocarbons for thermal oxidation during deep soil testing and influence from influent concentrations during lab sample collection.
**Initial deep constant rate test system influent vapor sample collected on 4/9 was anomalous as it is not consistent with the SVE-1B well head vapor sample.

TABLE 4
SHALLOW ZONE STEP TEST – WELLHEAD AND SYSTEM READINGS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

			Extraction Well Field Data (SVE-1A)												System Dilution	System Influent Data							System Effluent
Date	Time	Elapsed Time (hour)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Applied Vacuum (in. wc)	PID VOC Readings (ppmv)	FID (ppmv) w methane	FID (ppmv) w/o methane	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	RH (%)	Lab Sample Collected	Percent Open (%)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Horiba VOC Readings (ppmv)	CO (%)	CO ₂ (%)	Lab Sample Collected	Temp (°F)
Step 1			Average	3.4	4.1	56.1																	
4/2/2018	12:56	0	--	3.8	3.5	47.6	>15000	FO	FO	--	--	--	38.4	VSS01355	80	101	64	23.5	5	0	0.24	VSS01352	1503
4/2/2018	13:30	0.57	--	2.96	4.75	64.6	>15000	FO	FO	--	--	--	28.9		80	101	64.9	23	46	0	0.18		1506
Step 2			Average	5.9	6.0	81.6																	
4/2/2018	13:47	0	--	6.67	6.5	88.4	>15000	FO	FO	--	--	--	26.1	VSS01357	80	98	66.2	22	63	0	0.28	VSS01360	1517
4/2/2018	14:09	0.37	--	4.9	6.0	81.6	>15000	FO	FO	--	--	--	30.3		80	98	81.4	22	78	0	0.26		1521
4/2/2018	14:40	0.88	--	6.25	5.5	74.8	>15000	FO	FO	--	--	--	34.6		80	98	82.5	22	82	0	0.28		1530
Step 3			Average	7.4	12.0	163.1																	
4/2/2018	14:50	0	--	6.81	12.0	163.1	>15000	FO	FO	--	--	--	33.1	VSS01353	80	98	101	21.5	171	0	0.7	VSS01354	1531
4/2/2018	15:18	0.47	83	7.63	12.0	163.1	>15000	FO	FO	2.2	0	4.4	27.4		80	98	102.5	21.5	220	0	0.6		1554
4/2/2018	15:50	1	81	7.72	12.0	163.1	>15000	FO	FO	2.5	0.2	4.4	25.4		80	98	104.1	21.5	240	0	0.63		1564
Step 4			Average	9.8	17.2	234.3																	
4/2/2018	16:05	0	78.8	8.17	17.0	231.1	no readings collected as high system vacuum could not be overcome by sample box; Tedlar bag could not be filled						18.4		80	98	118	21.3	292	0	0.72	VSS01358	1577
4/2/2018	16:30	0.42	71.2	13.2	17.5	237.9							20.8		--								
4/2/2018	16:57	0.87	68.3	7.99	17.2	233.8							23.6	VSS01359	80	99	122.1	21.2	402	0	1.06	VSS01356	1593

Notes:
RH: Relative Humidity
-- = readings inadvertently missed
°F = degrees Fahrenheit
scfm = standard cubic feet per minute
in. Hg = inches Mercury
in. wc = inches water column
ppmv = parts per million by volume
FO = flame out due to insufficient oxygen

TABLE 5
SHALLOW ZONE STEP TEST VACUUM INFLUENCE
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Step No.	SVE-1A Wellhead Vacuum (in wc)	Average Well Flow Rate (scfm)	Date Measured		Vacuum (in wc)				
					VM-1A*	VM-2A	VM-3A	VM-4A	VM-5A
			<i>Distance from SVE-1A</i>		7'	10'	15'	20'	30'
1	56	3.4	4/2/2018	12:54	0.00	0.13	0.00	0.00	0.00
			4/2/2018	13:09	0.00	0.13	0.00	0.00	0.00
			4/2/2018	13:24	0.00	0.13	0.00	0.00	0.00
			4/2/2018	13:39	0.00	0.10	0.00	0.00	0.06
2	82	5.9	4/2/2018	13:54	0.00	0.18	0.00	0.00	0.00
			4/2/2018	14:09	0.00	0.19	0.00	0.02	0.00
			4/2/2018	14:24	0.02	0.20	0.07	0.06	0.03
			4/2/2018	14:39	0.00	0.16	0.07	0.03	0.00
3	163	7.4	4/2/2018	14:55	0.02	0.50	0.14	0.12	0.09
			4/2/2018	15:10	0.02	0.58	0.22	0.18	0.14
			4/2/2018	15:25	0.00	0.50	0.17	0.12	0.10
			4/2/2018	15:40	0.03	0.54	0.18	0.14	0.11
			4/2/2018	15:55	0.02	0.54	0.16	0.13	0.10
4	234	9.8	4/2/2018	16:10	0.01	0.78	0.32	0.23	0.18
			4/2/2018	16:25	0.03	0.80	0.36	0.28	0.21
			4/2/2018	16:40	0.06	0.94	0.44	0.34	0.34
			4/2/2018	16:55	0.04	0.94	0.42	0.32	0.31

Notes:

in wc = inches of water column

scfm = standard cubic feet per minute

*anomalous vacuum response in VM-1A

TABLE 6
SHALLOW ZONE CONSTANT RATE TESTING SYSTEM READINGS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

			Extraction Well Field Data (SVE-1A)											System Dilution Data		System Influent Data							System Effluent Data			
Date	Time Interval (hour)	Elapsed Time (hour)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Applied Vacuum (in. wc)	PID VOC Readings (ppmv)	FID (ppmv) w methane	FID (ppmv) w/o methane	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	RH (%)	Lab Sample Collected	Percent Open (%)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Horiba VOC Readings (ppmv)	CO (%)	CO ₂ (%)	Lab Sample Collected	Temp (°F)	Horiba VOC Readings (ppmv)	CO ₂ (%)	Lab Sample Collected
Average			71.0	10.9	12	164.8	>15000	FO	FO	3.0	1.0	9.7	34			102	100.7	21	372	0.0	1.3		1516	2	4.3	
4/3/18 7:50	0	0	60.6	9.47	12	163.1	>15000	FO	FO	2.3	0	4.7	43.2		80	98	72.1	20	129	0	0.66		1449	0		
4/3/18 9:16	1.43	1.43	75.1	6.9	11.5	156.3	>15000	FO	FO	3.2	0	5.1	28.9	VSS01361	80	100	84	20	269	0	0.7	VSS01363	1512	6	5.06	VSS01362
4/3/18 10:50	1.57	3.00	71.2	11.2	12	163.1	>15000	FO	FO	3.1	0	6.9	29.7		80	102	106.8	21	255	0	0.74		1531	2	4.14	
4/3/18 12:30	1.67	4.67	80.7	10.2	13.5	183.5	>15000	FO	FO	2.9	0	6.3	32.4		80	102	104.5	21	307	0	0.71		1527	5	4.04	
4/3/18 14:00	1.50	6.17	76.4	10.1	12	163.1	>15000	FO	FO	2.6	0.1	6.7	26.4		80	102	103.8	21	310	0	0.8		1531	6	4.12	
4/3/18 15:30	1.50	7.67	78.3	13.3	11.5	156.3	>15000	FO	FO	2.9	0	7.2	24.7		80	100	104.2	21	307	0	0.92		1532	7	4.16	
4/3/18 16:55	1.42	9.08	66.6	9.4	11	149.5	>15000	FO	FO	2.9	0.1	7	29.3		80	100	104.3	21	310	0	0.89		1532	5	4.14	
4/4/18 7:00	14.08	23.17	60.2	16.75	13	176.7	>15000	FO	FO	3.5	0.2	9.7	48		80	103	93.9	21	352	0	1.24		1565	4	4.3	
4/4/18 8:00	1.00	24.17	59.5	12.62	12	163.1	>15000	FO	FO	2.9	0.1	10	45		80	101	93.7	21	398	0	1.42		1474	2	4.16	
4/4/18 9:30	1.50	25.67	62.7	18.5	13	176.7	>15000	FO	FO	3	0.8	10	45.5		80	101	104.2	21	400	0	1.4		1463	3	4.08	
4/4/18 11:00	1.50	27.17	75	10.95	11.5	156.3	>15000	FO	FO	3.2	0.8	10	28.8		80	101	104.1	21	375	0	1.34		1460	4	4.2	
4/4/18 12:30	1.50	28.67	81	8.4	12.5	169.9	>15000	FO	FO	3.1	0.8	10	22.4		80	103	104.4	21	386	0	1.36		1471	3	4.1	
4/4/18 14:00	1.50	30.17	72.9	12.8	13	176.7	>15000	FO	FO	3	1.6	10	30.6		80	103	104.6	21	407	0	1.38		1474	5	4.12	
4/4/18 15:30	1.50	31.67	71.5	15.6	12	163.1	>15000	FO	FO	3.1	1.2	10	32.1		80	102	103.9	21	403	0	1.4		1476	3	4.18	
4/4/18 17:00	1.50	33.17	65.3	11.4	11.5	156.3	>15000	FO	FO	2.6	0.9	11	58.4		80	102	104.1	21	387	0	1.41		1472	3	4.2	
4/4/18 19:00	2.00	35.17	SVE unit shutdown due to high temp of generator; restarted at 745 on 4/5/18 after coolant added																							
4/5/18 8:00	0.25	35.42	61.4	12.47	11.5	156.3	>15000	FO	FO	3.2	0.7	11	47.1		80	100	98.9	21	321	0	1.32		1474	0	4.54	
4/5/18 9:30	1.50	36.92	62.1	9.84	11	149.5	>15000	FO	FO	2.8	1.7	11	46.5		80	101	99.1	21	365	0	1.46		1559	0	4.56	
4/5/18 11:00	1.50	38.42	67.9	12.45	13	176.7	>15000	FO	FO	3	0.8	11	35		80	101	99.4	21	412	0	1.6		1588	0	4.68	
4/5/18 12:00	1.00	39.42												VSS01365								VSS01366				VSS01367
4/5/18 12:30	0.50	39.92	71.5	10.19	13	176.7	>15000	FO	FO	3.2	1.5	11	30.7		80	102	100.2	21	433	0	1.64		1602	0	4.68	
4/5/18 14:00	1.50	41.42	80.7	8.27	12.5	169.9	>15000	FO	FO	2.9	0.5	11	23.2		80	102	100.4	21	458	0	1.46		1487	0	4.24	
4/5/18 15:30	1.50	42.92	78	9.13	12.5	169.9	>15000	FO	FO	2.9	0.5	11	24.3		80	102	100.1	21	410	0	1.45		1468	0	4.12	
4/5/18 17:00	1.50	44.42	66	8.15	11	149.5	>15000	FO	FO	2.7	1	11	39.4		80	100	100.6	21	398	0	1.5		1530	0	4.34	
4/6/18 7:00	14.00	58.42	56.6	10.24	12	163.1	>15000	FO	FO	2.6	0.7	12	49.7		80	100	103.9	21	420	0	1.64		1529	1	4.42	
4/6/18 8:00	1.00	59.42	63.2	10.1	13	176.7	>15000	FO	FO	3.2	0.2	11	38.1		80	102	104.1	21	458	0	1.78		1536	0	4.54	
4/6/18 9:30	1.50	60.92	77.9	9.52	11.5	156.3	>15000	FO	FO	3.5	1.9	11	26		80	103	104.4	21	423	0	1.54		1537	0	4.38	
4/6/18 11:00	1.50	62.42	80.5	9.91	12	163.1	>15000	FO	FO	2.7	2.7	12	23.7		80	104	104.2	21	427	0	1.52		1539	0	4.38	
4/6/18 12:30	1.50	63.92	78.8	10.13	12.5	169.9	>15000	FO	FO	3.1	3.1	11	24.4		80	110	104.6	21	433	0	1.56		1542	0	4.32	
4/6/18 14:00	1.50	65.42	77.5	8.73	12	163.1	>15000	FO	FO	2.9	2.9	11	25.2		80	110	104.3	21	412	0	1.54		1544	0	4.31	
4/6/18 15:00	1.00	66.42	79.9	9.58	12	163.1	>15000	FO	FO	3.2	3.2	11	22.8	VSS01368	80	110	104.4	21	421	0	1.52	VSS01369	1547	0	4.29	VSS01370

Notes:
RH: Relative Humidity
°F = degrees Fahrenheit
scfm = standard cubic feet per minute
in. Hg = inches Mercury
ppmv = parts per million by volume
FO = flame out due to insufficient oxygen

TABLE 7
SHALLOW ZONE CONSTANT RATE VACUUM INFLUENCE
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Date Measured	Time Interval (hours)	Elapsed Time (hours)	Applied Vacuum (in wc)	Vacuum Influence (in wc)				
			SVE-1A	VM-1A	VM-2A	VM-3A	VM-4A	VM-5A
		Distance from SVE-1A		7'	10'	15'	20'	30'
4/3/18 7:00	0.00	0.00	163	0.00	0.19	0.17	0.14	0.20
4/3/18 11:21	3.52	3.52	163	0.00	0.75	0.41	0.29	0.28
4/3/18 16:00	4.65	8.17	150	0.17	0.75	0.36	0.26	0.26
4/4/18 7:10	15.17	23.33	163	0.00	1.00	0.56	0.44	0.44
4/4/18 16:45	9.58	32.92	156	0.31	0.83	0.42	0.30	0.26
Unit shutdown for 12.75 hours from 4/4 1900 to 4/5 0745								
4/5/18 7:55	2.42	35.33	156	0.00	0.86	0.45	0.35	0.35
4/5/18 11:58	4.05	39.38	177	0.42	0.95	0.49	0.37	0.34
4/5/18 16:50	4.87	44.25	150	0.34	0.77	0.36	0.26	0.20
4/6/18 7:00	14.17	58.42	163	0.05	1.01	0.57	0.42	0.41
4/6/18 14:45	7.75	66.17	163	0.11	0.76	0.33	0.23	0.18

Notes:

in wc = inches of water column

*anomalous vacuum response in VM-1A

TABLE 8
DEEP ZONE STEP TESTING SYSTEM READINGS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

			Extraction Well Field Data (SVE-1B)													System Dilution Data	System Influent Data							System Effluent Data
Date	Time	Elapsed Time (hour)	Temp (°F)	Differential Pressure (In. WC) ¹	Flow Rate* (scfm)	Applied Vacuum (in. wc)	PID VOC Readings (ppmv)	FID (ppmv) w methane	FID (ppmv) w/o methane	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	RH (%)	Lab Sample Collected	Percent Open (%)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Horiba VOC Readings (ppmv)	CO (%)	CO ₂ (%)	Lab Sample Collected	Temp (°F)	
Step 1			Average	0.9	67.6	26																		
4/9/2018	825	0	75.8	0.9	68.7		>15000	FO	FO	0.3	0.2	15.7	33.5	VSS01372	60	100	81.2	14	1390	0	1.58	VSS01371	1629	
4/9/2018	920	0.9	74.5	0.9	67.2		>15000	FO	FO	2.9	0.7	14.2	36		60	110	81.4	14	1788	0	1.51		1520	
4/9/2018	950	1.4	75.5	0.9	66.8	26	>15001	FO	FO	2.5	2.5	13.5	35.4		60	120	81.6	14	1907	0	1.47		1492	
Step 2			Average	2.3	104	35																		
4/9/2018	1005	0	80.2	2.25	102		>15000	FO	FO	0.4	1.8	15.2	31.3	VSS01374	60	120	101.3	11	2120	0	1.26	VSS01373	1549	
4/9/2018	1035	0.5	80.5	2.3	101	35	>15000	FO	FO	0.5	3.1	14.9	30.9		60	120	101.2	11	2350	0	1.22		1614	
4/9/2018	1105	1	92.6	2.3	110		>15000	FO	FO	0.5	4	14.7	10.8		60	120	102.1	11	2480	0	1.22		1525	
Step 3			Average	2.4	110	44																		
4/9/2018	1220	0	98.8	2.4	109	43	>15000	FO	FO	0.7	5	14.4	11.3	VSS01376	60	120	100.5	11	2470	0	1.22	VSS01375	1576	
4/9/2018	1245	0.4	96.1	2.4	111	44	>15000	FO	FO	0.6	5.8	14.3	9.4		60	130	100.9	11	2540	0	1.22		1472	
Step 4			Average	3.6	132	57																		
4/9/2018	1315	0	100.7	3.8	138	65	>15000	FO	FO	0.1	6.9	14.2	3.3	VSS01378	60	130	129.2	6	2500	0	1.32	VSS01377	1599	
4/9/2018	1320	0.1				55																		
4/9/2018	1345	0.5	99.1	3.5	131	54	>15000	FO	FO	0.1	3.8	14.6	9.5		60	130	130.1	6	2370	0	1.32		1515	
4/9/2018	1415	1	92.6	3.4	126	55	>15000	FO	FO	0.6	3.3	14.3	25	VSS01380	60	130	130.4	6	2250	0	1.34	VSS01379	1540	

Notes:

1) Flow rate will be calculated using differential pressure

*High wellhead flowrates measured by the VelociCalc during the deep soil pilot test were likely overestimated by approximately 75 percent based on a mass balance with benzene and ethylbenzene concentrations (Attachment 6).

RH: Relative Humidity

°F = degrees Fahrenheit

scfm = standard cubic feet per minute

in. Hg = inches Mercury

ppmv = parts per million by volume

FO = flame out due to insufficient oxygen

-- = readings inadvertently missed

TABLE 9
DEEP ZONE STEP TEST VACUUM INFLUENCE
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Step No.	SVE-1B Wellhead Vacuum (in wc)	Average Well Flow Rate (scfm)	Date Measured		Vacuum (in wc)				
					VM-1B	VM-2B	VM-3B	VM-4B	VM-5B
			<i>Distance from SVE-1B</i>		15'	22'	27'	38'	50'
1	26	68	4/9/2018	8:35	3.27	2.50	2.26	1.70	1.32
			4/9/2018	9:15	3.24	2.50	2.21	1.67	1.30
			4/9/2018	9:36	3.52	2.81	2.39	1.90	1.54
			4/9/2018	9:46	3.56	2.84	2.43	1.94	1.57
			4/9/2018	10:00	3.58	2.87	2.46	1.97	1.59
2	35	104	4/9/2018	10:15	5.17	4.08	3.56	2.78	2.21
			4/9/2018	10:30	5.35	4.26	3.65	2.92	2.35
			4/9/2018	10:45	5.39	4.32	3.69	2.98	2.42
			4/9/2018	11:00	5.33	4.31	3.65	2.98	2.41
3	44	110	4/9/2018	12:20	4.73	5.39	3.28	2.45	1.89
			4/9/2018	12:35	5.21	4.15	3.57	2.82	2.25
			4/9/2018	12:50	5.30	4.22	3.64	2.91	2.35
			4/9/2018	13:05	5.30	4.24	3.64	2.89	2.32
4	57	132	4/9/2018	13:20	6.29	5.03	4.26	3.34	2.66
			4/9/2018	13:35	6.22	4.94	4.26	3.35	2.66
			4/9/2018	13:50	6.29	5.01	4.33	3.43	2.76
			4/9/2018	14:15	6.35	5.08	4.34	3.48	2.81

Notes:

in wc = inches of water column

*High wellhead flowrates measured by the VelociCalc during the deep soil pilot test were likely overestimated by approximately 75 percent based on a mass balance with benzene and ethylbenzene concentrations (Attachment 6).

TABLE 10
DEEP ZONE CONSTANT RATE TESTING SYSTEM READINGS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

			Extraction Well Field Data (SVE-1B)												System Dilution Data		System Influent Data								System Effluent Data		
Date/ Time	Time Interval (hour)	Elapsed Time (hour)	Temp (°F)	Differential Pressure (In. WC) ¹	Flow Rate* (scfm)	Applied Vacuum (in. wc)	PID VOC Readings (ppmv)	FID (ppmv) w methane	FID (ppmv) w/o methane	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	RH (%)	Lab Sample Collected	Percent Open (%)	Temp (°F)	Flow Rate (scfm)	Applied Vacuum (in. Hg)	Horiba VOC Readings (ppmv)	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	Lab Sample Collected	Temp (°F)	Horiba VOC Readings (ppmv)	Lab Sample Collected	
		Average	77.7	3.4	128	53	>15000	FO	FO	4.7	4.5	13.5	27.3			122	116.7	5	2,000	13.3	3.4	7.0		1552	0		
4/9/18 14:45	0	0	89.9	3.4	124	55	>15000	FO	FO	4.4	3.8	11.7	25.1		60	130	102.1	6	2,230	10.3	2.9	7.3		1466	1		
4/9/18 16:15	1.5	1.5	91.1	3.4	125	55	>15000	FO	FO	1.7	4.8	14.1	18.1	VSS01381	60	130	102.4	6	2,190	19.9	1.3	8.5	VSS01382	1542	1	VSS01383	
4/9/18 17:25	1.17	2.7	83.9	3.4	125	55	>15000	FO	FO	1.2	3.5	14.6	23.8		60	130	102.3	6	2,140	12.3	2.0	6.2		1532	1		
4/9/18 20:00	2.58	5.3	System shutdown due to high temperature																								
4/10/18 7:00	11.00	5.3	System restarted																								
4/10/18 7:30	0.50	5.8	63.9		113	56	>15000	FO	FO	2.1	1.3	14.9	63.4		60	120	129.4	6	1,945	11.0	1.1	7.9		1471	0		
4/10/18 9:20	1.83	7.6	74.8		130	55	>15000	FO	FO	2.5	2.7	14.6	42.9		60	130	138.6	6	2,280	10.8	2.7	7.8		1574	0		
4/10/18 10:50	1.50	9.1	85.6		155	55	>15000	FO	FO	2	5.3	14.7	20.9		60	138	128.3	6	2,310	10.8	3.6	7.5		1604	0		
4/10/18 11:50	1.00	10.1	89.5		161	55	>15000	FO	FO	2	6.4	14.5	20.8		60	138	129.2	6	2,230	10.6	4.9	7.5		1611	0		
4/10/18 13:00	1.17	11.3	Unit switched from 3-phase to single phase operations due to fluctuating temperature																								
4/10/18 13:10	0.17	11.4				52	>15000	FO	FO																		
4/10/18 13:20	0.17	11.6	95.4		158	52	>15000	FO	FO	2.3	4.8	14.1	16.5		60	140	115.4	6	2,280	10.2	3.5	7.9		1534	3		
4/10/18 14:50																120	101.5	8	3,190					1512	0		
4/10/18 15:07	1.78	13.4	84.5		138	54	>15000	FO	FO	2.8	6.1	14	22.2		60	120	116.9	5	2,440	19.9	2.2	8.5		1744	0		
4/10/18 16:20	1.22	14.6	83.3		140	52	>15000	FO	FO	2.5	2.1	14.7	17.6		60	120	117.3	5	2,140	12.3	3.2	6.5		1495	0		
4/10/18 17:30	1.17	15.8	85.5		135	52	>15000	FO	FO	2.5	3.8	13.7	15.9		60	120	118.2	5	2,160	11.1	2.6	7.5		1522	0		
4/11/18 7:25	13.92	29.7	62.5		108	52	>15000	FO	FO	3.8	1.9	14.6	67.3		60	120	116.1	5	1,779	12.6	2.1	7.0		1590	0		
4/11/18 9:00	1.58	31.3	70.6		117	52	>15000	FO	FO	4.3	5	14	50.4		60	120	115.4	5	2,010	12.0	5.2	7.3		1590	0		
4/11/18 10:30	1.50	32.75	75.7		130	52	>15000	FO	FO	4.2	9.2	14	41.5	VSS01384	60	120	116.2	5	2,060	12.2	5.6	7.0	VSS01385	1517	0	VSS01386	
4/11/18 12:00	1.50	34.3	79.3		135	52	>15000	FO	FO	4.3	6.8	14	38.5		60	120	116.1	5	2,020	12.8	4.8	6.6		1589	0		
4/11/18 13:00	1.00	35.3				52	>15000	FO	FO	4.4	7.7	13.9			60	120	116.3	5	2,010	12.7	5.3	6.6		1475	0		
4/11/18 14:30	1.50	36.8	83.9		137	52	>15000	FO	FO	4.4	7.4	13.8	21.7		60	120	116.4	5	2,070	12.7	5.8	6.6		1584	0		
4/11/18 16:00	1.50	38.3	76.8		127	52	>15000	FO	FO	4.7	6.6	13.7	44.2		60	120	116.3	5	1,934	13.2	5	6.3		1590	0		
4/11/18 17:15	1.25	39.5	76.6		122	52	>15000	FO	FO	7.2	5.4	13.2	40.8		60	120	116.0	5	1,902	21.2	2.8	8.2		1586	0		
4/12/18 7:10	13.92	53.42	60.0		107	52	>15000	FO	FO	6.1	0.6	13.6	60.8		60	110	116.5	5	1,658	13.7	0.9	6.6		1579	0		
4/12/18 8:30	1.33	54.75	67.5		107	52	>15000	FO	FO	6.0	2.1	13.4	32.7		60	120	116.4	5	1,766	13.5	2.5	6.5		1574	0		
4/12/18 10:00	1.50	56.3	80.5		121	52	>15000	FO	FO	5.5	5.0	13.7	11.1	VSS01387	60	120	116.1	5	1,779	13.1	3.8	6.8	VSS01388	1572	0	VSS01389	
4/12/18 11:30	1.50	57.75	77.8		125	52	>15000	FO	FO	6.2	6.2	13.0	15.9		60	120	116.6	5	1,798	13.6	5.5	6.3		1574	0		
4/12/18 13:00	1.50	59.25	83.4		128	52	>15000	FO	FO	6.2	11.5	12.7	17.7		60	120	117.0	5	1,785	13.4	9.1	6.2		1544	0		
4/12/18 14:30	1.50	60.8	80.6		125	52	>15000	FO	FO	6.7	7.6	12.4	19.8		60	120	116.2	5	1,808	13.3	3.2	6.5		1593	0		
4/12/18 16:00	1.50	62.25	82.1		130	52	>15000	FO	FO	6.3	1.8	13.1	18.2		60	120	116.1	5	1,859	12.3	4.5	7.6		1451	0		
4/12/18 17:30	1.50	63.75	82.0		132	52	>15000	FO	FO	7.4	1.5	12.2	17.0		60	120	116.2	5	1,851	12.5	2.5	7.5		1506	0		
4/13/18 7:00	13.50	77.25	52.4		101	52	>15000	FO	FO	7.4	1.0	12.7	30.7		60	110	116.4	5	1,543	14.9	0.9	5.8		1531	0		
4/13/18 8:00	1.00	78.25	64.2		106	52	>15000	FO	FO	7.2	5.0	12.5	21.6		60	110	116.4	5	1,676	13.9	1.8	6.4		1531	0		
4/13/18 9:00	1.00	79.25	67.0		119	52	>15000	FO	FO	7.1	1.8	12.7	16.7		60	110	118.2	5	1,688	13.8	2.9	6.4		1542	0		
4/13/18 10:00	1.00	80.25	77.4		132	52	>15000	FO	FO	6.4	3.2	13.0	7.5		60	120	118.1	5	1,798	13.5	3.0	6.2		1541	0		
4/13/18 11:00	1.00	81.25	79.3		134	52	>15000	FO	FO	6.9	4.1	12.6	5.7		60	120	118.2	5	1,832	14.5	2.5	5.6		1545	0		
4/13/18 11:45	0.75	82.00												VSS01390									VSS01392			VSS01391	
4/13/18 12:00	0.25	82.25	80.8		140	52	>15000	FO	FO	6.8	3.7	12.6	5.6		60	120	118.1	5	1,845	13.8	1.2	6.3		1545	0		

Notes:

1) Flow rate will be calculated using differential pressure

*High wellhead flowrates measured by the VelociCalc during the deep soil pilot test were likely overestimated. Based on a mass balance with benzene and ethylbenzene concentrations (Attachment 6), the deep zone flow rates likely ranged between 40 and 79 scfm.

RH: Relative Humidity

°F = degrees Fahrenheit

scfm = standard cubic feet per minute

in. Hg = inches Mercury

ppmv = parts per million by volume

FO = flame out due to insufficient oxygen

TABLE 11
DEEP ZONE CONSTANT RATE VACUUM INFLUENCE
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Date Measured	Time Interval (hours)	Elapsed Time (hours)	Applied Vacuum (in wc)	Vacuum (in wc)											Notes
			SVE-1B	VM-1A	VM-2A	VM-3A	VM-4A	VM-5A	SVE-1A	VM-1B	VM-2B	VM-3B	VM-4B	VM-5B	
		Distance from SVE-1B		19'	32'	36'	19'	43'	24'	15'	22'	27'	38'	50'	
4/9/18 14:45	0.00	0.00	54	--	--	--	--	--	--	6.42	5.15	4.42	3.58	2.91	
4/9/18 16:15	1.50	1.50	54	--	--	--	--	--	--	6.40	5.11	4.37	3.52	2.85	
4/9/18 17:30	1.25	2.75	55	--	--	--	--	--	--	6.52	5.21	4.46	3.56	2.97	
Unit shutdown for 11 hours from 2000 on 4/9 to 700 on 4/10															
4/10/18 7:55	3.42	6.17	55	--	--	--	--	--	--	6.65	5.32	4.55	3.72	3.02	
4/10/18 11:00	3.08	9.25	55	0.00	3.92	3.87	5.59	3.50	4.50	6.69	5.36	4.58	3.78	3.10	
4/10/18 17:00	6.00	15.25	52	--	--	--	--	--	--	6.23	5.00	4.24	3.47	2.81	
4/11/18 6:45	13.75	29.00	52	--	--	--	--	--	--			4.31			
4/11/18 8:40	1.92	30.92	52	--	--	--	--	--	--	6.35	5.12		3.60	2.96	
4/11/18 14:30	5.83	36.75	52	0.00	3.41	3.38	5.04	2.97	3.98	6.08	4.85	4.10	3.32	2.66	
4/11/18 16:30	2.00	38.75	52	--	--	--	--	--	--	6.12	4.89	4.15	3.35	2.71	
4/12/18 6:45	14.25	53.00	52	--	--	--	--	--	--			4.29			
4/12/18 7:45	1.00	54.00	52	--	--	--	--	--	--	6.35	5.08		3.59	2.94	
4/12/18 10:10	2.42	56.42	52	--	--	--	--	--	--	6.29	5.05		3.60	2.92	manometer readings
4/12/18 10:10	0.00	56.42	52	--	--	--	--	--	--	6.20	5.00		3.60	2.90	magnehelic readings
4/12/18 17:00	6.83	63.25	52	4.06	3.30	3.06	5.09	3.01	--	6.12	5.00	4.16	3.37	2.73	
4/13/18 7:00	14.00	77.25	52	--	--	--	--	--	--	6.18	4.97	4.22	3.42	2.81	Vacuum measurement collected at MW-21 approximately 200 feet from SVE-1B; 1.17 in wc
4/13/18 11:40	4.67	81.92	52	4.18	3.16	3.21	5.10	2.76	2.72	6.10	4.81	4.02	3.74	2.06	

Notes:

in wc = inches of water column

-- = data not collected

TABLE 12
DIOXIN/FURAN SVE EMISSIONS SAMPLING RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Shallow Outdoor Soil Pilot Test (SVE-1A)					
Parameter	Unit	Run 1	Run 2	Run 3	Average
Run Duration	hr	4	4	4	
End Date	m/d/yr	4/4/18	4/5/18	4/6/18	
End Time	hr:min	12:10	12:41	11:29	
Total PCDDs/PCDFs	ng/dscm	0.138	0.73	0.0588	0.309
	lbs/hr	5.15E-11	2.56E-10	2.04E-11	1.09E-10
Flow Rate	dscfm	100	93.7	92.8	95.5

Deep Soil Pilot Test (SVE-1B)					
Parameter	Unit	Run 1	Run 2	Run 3	Average
Run Duration	hr	4	4	4	
End Date	m/d/yr	4/11/18	4/12/18	4/13/18	
End Time	hr:min	10:02	11:34	11:36	
Total PCDDs/PCDFs	ng/dscm	0.0359	0.013	0.0128	0.0206
	lbs/hr	1.74E-11	6.34E-12	6.24E-12	9.99E-12
Flow Rate	dscfm	129	152	151	144

Notes

PCDDs - Polychlorinated dibenzo-P-dioxins

PCDFs - Polychlorinated dibenzofurans

ng/dscm - nanograms per dry standard cubic meter

TABLE 13
DIOXIN/FURAN BACKGROUND/AMBIENT AIR SAMPLING RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Parameter	Unit	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7
Run Duration	hr	24	24	24	24	24	24
End Date	m/d/yr	4/5/18	4/6/18	4/10/18	4/11/18	4/12/18	4/13/18
End Time	hr:min	11:35	11:45	10:25	10:35	10:40	10:45
Total PCDDs/PCDFs	ng/m3	8.59E-04	6.91E-05	1.43E-04	1.56E-03*	1.02E-03	1.10E-03

Notes

PCDDs - Polychlorinated dibenzodioxins

PCDFs - Polychlorinated dibenzofurans

ng/m3 - nanograms per cubic meter

*Concentration may be biased high (see explanation in Section 6 of AKI's Report, Attachment 3)

Run 1 deemed invalid by AKI, so not included in results.

ATTACHMENTS

ATTACHMENT 1

Well Construction Diagrams

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID VWL0011 (WELL ID: SVE-1A)

Easting Northing

Geologist B. SHORE / C. ECKERT

Date 5/24/2017

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth 16.0' BGS

Pilot Borehole Diameter 7 1/4"

Reamed Diameter N/A

Casing Stick-Up Height 0

Drilling Co/Driller GREGG DRILLING / BRANDON MAPLE

Rig FRASTE XLMAX 250 SONIC

Bit(s) 7" CD CORE BARREL

Drilling Fluid N/A

WELL DESIGN & SPECIFICATIONS

DEPTH	STRING(S)
0	7
7	15
6	16
0	6
	2" BLANK SCH. 40 PVC
	2" SLOTTED 0.020" SCH. 40 PVC
	#2/12 MONTEREY SAND
	BENTONITE CHIPS

Protective Casing N/A

Casing 2" SCH. 40 PVC

Screen 0.020" SLOTTED 2" SCH. 40 PVC

Filter Pack CEMEX 'LAPIS LUSTRE' #2/12 MONTEREY SAND

Bentonite WMO-BEN ENVIROPLUG MEDIUM CHIPS

Grout N/A

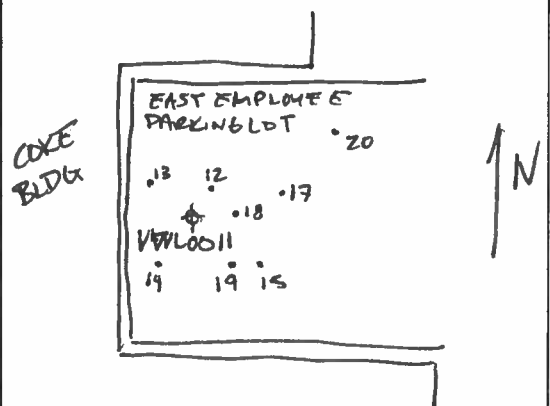
CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling				
	5/24	0800	5/24	0850
Casing	5/24	0850	5/24	0855
Filter Pack Placement	5/24	0855	5/24	0900
BENTONITE SEAL	5/24	0900	5/24	0905
Well				
FLUSH MOUNT BOX	5/24	1045		1100
Completion			5/24	1110

COMMENTS

5 x 50 lb BAGS SAND
2 x 50 lb BAGS BENTONITE
2

LOCATION DIAGRAM



6.0

7.0

15.0

16.0

BENTONITE

SAND

GROUT

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID

VWLD012 (WELL ID: VM-1A)

Easting

Northing

Geologist

R. SHORE / C. ECKERT

Date

5/25/2017

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth

16.0' BGS

Pilot Borehole Diameter

7 1/4"

Reamed Diameter

N/A

Casing Stick-Up Height

0

Drilling Co/Driller

GREEN DRILLING / BRANDON MAPLE

Rig

FRASTE XL MAX 250 SONIC

Bit(s)

7" OD CORE BARREL

Drilling Fluid

N/A

WELL DESIGN & SPECIFICATIONS

DEPTH

STRING(S)

0

7

2" BLANK SCH. 40 PVC

7

15

2" SLOTTED 0.020" SCH. 40 PVC

6

16

#2/12 MONTEREY SAND

0

6

BENTONITE SEAL

Protective Casing

N/A

Casing

2" SCHEDULE 40 PVC

Screen

0.020" SLOTTED
2" SCH. 40 PVC

Filter Pack

CEMEX 'LAPIS LUSTRE'
#2/12 MONTEREY SAND

Bentonite

WYOMEN ENVIRONMENTAL
MEDIUM CHIPS

Grout

N/A

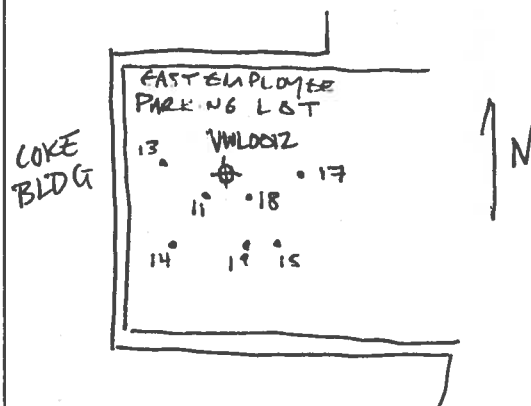
CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling	5/25	1320	5/25	1330
Casing	5/25	1330	5/25	1335
Filter Pack Placement	5/25	1335	5/25	1340
BENTONITE SEAL	5/25	1340	5/25	1345
Well				
FLUSH MOUNT BOX	5/25	1500	5/25	1520
Completion			5/25	1520

COMMENTS

5x50lb BAGS SAND
2x50lb BAGS BENTONITE

LOCATION DIAGRAM



BENTONITE

SAND

6.0

7.0

15.0

16.0

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID **VWLO013 (WELL ID: VM-2A)**

Easting Northing

Geologist **R. SHORE / C. ECKERT**

Date **5/25/2017**

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth

Pilot Borehole Diameter **7 1/4"**

Reamed Diameter **N/A**

Casing Stick-Up Height **0**

Drilling Co/Driller **GRUBB DRILLING / BRANDON MAPLE**

Rig **FRASTE XL MAX 250 SONIC**

Bit(s) **7" OD CORE BARREL**

Drilling Fluid **N/A**

WELL DESIGN & SPECIFICATIONS

DEPTH		STRING(S)
0	7	2" BLANK SCH. 40 PVC
7	15	2" SLOTTED 0.020" SCH. 40 PVC
6	16	#2/12 MONTEREY SAND
0	6	BENTONITE SEAL

Protective Casing **N/A**

Casing **2" SCHEDULE 40 PVC**

Screen **0.020" SLOTTED
2" SCH. 40 PVC**

Filter Pack **CEMEX 'LAPIS LUSTRE'
#2/12 MONTEREY SAND**

Bentonite **WYOMING ENVIRONMENTAL
MEDIUM CHIPS**

Grout **N/A**

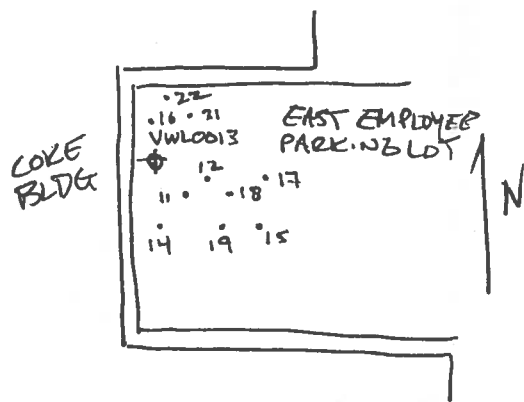
CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling	5/25	1435	5/25	1445
Casing	5/25	1445	5/25	1450
Filter Pack Placement	5/25	1450	5/25	1455
BENTONITE SEAL	5/25	1455	5/25	1500
Well				
FLUSH MOUNT BOX	5/25	1500	5/25	1520
Completion			5/25	1520

COMMENTS

**5x 50lb BAGS SAND
2x 50lb BAGS BENTONITE**

LOCATION DIAGRAM



6.0

7.0

15.0

16.0

BENTONITE

SAND

GROUT

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID

VWLO014 (WELLID: VM-3A)

Easting

Northing

Geologist

R. SHORE / C. ECKERT

Date

5/25/2017

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth

16.0' BGS

Pilot Borehole Diameter

7 1/4"

Reamed Diameter

N/A

Casing Stick-Up Height

0

Drilling Co/Driller

GREEN DRILLING / BRANDON MARLE

Rig

FRASTE XL MAX 250 SONIC

Bit(s)

7" OD CORE BARREL

Drilling Fluid

N/A

WELL DESIGN & SPECIFICATIONS

DEPTH

STRING(S)

0

7

2" SCH. 40 PVC BLANK

7

15

2" SDR19 0.020" SCH. 40 PVC

6

16

#2/12 MONTEREY SAND

0

6

BENTONITE SEAL

Protective Casing

N/A

Casing

2" SCHEDULE 40 PVC

Screen

0.020" SLOTTED
2" SCH. 40 PVC

Filter Pack

CEMEX 'LAPIS LUSTRE'
#2/12 MONTEREY SAND

Bentonite

WYOMEN ENVIRAPLUG
MEDIUM CHIPS

Grout

N/A

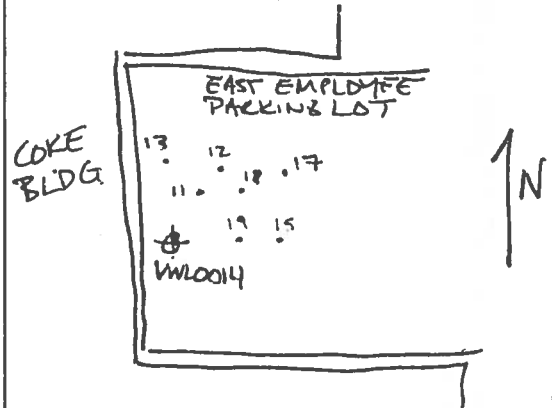
CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling	5/25	1350	5/25	1355
Casing	5/25	1355	5/25	1400
Filter Pack Placement	5/25	1400	5/25	1405
BENTONITE SEAL	5/25	1405	5/25	1410
Well				
FLUSH MANT BOX	5/25	1410	5/25	1430
Completion			5/25	1430

COMMENTS

5 x 50 lb BAGS SAND
2 x 50 lb BAGS BENTONITE

LOCATION DIAGRAM



WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID **VWL 0016 (WELL ID: VM-5A)**

Date **5/24/2017**

Easting

Northing

Ground Level Elevation

Geologist **R. SHORE / C. ECKERT**

Top of Casing Elevation

BORING SUMMARY

CONSTRUCTION TIME LOG

Total Depth **16.0' BGS**

TASK	DATE	TIME	DATE	TIME
Drilling	5/24	1150	5/24	1200

Pilot Borehole Diameter **7 1/4"**

Reamed Diameter **N/A**

Casing Stick-Up Height **0**

Casing	5/24	1200	5/24	1205
--------	------	------	------	------

Drilling Co/Driller **GREEN DRILLING / BRANDON MAPLE**

Rig **FRASER XLMAX 250 SONIC**

Bit(s) **7" OD CORE BARREL**

Filter Pack Placement	5/24	1210	5/24	1215
-----------------------	------	------	------	------

Drilling Fluid **N/A**

BENTONITE SEAL	5/24	1235	5/24	1245
----------------	------	------	------	------

Well				
------	--	--	--	--

FLUSH MOUNT BOX	5/24	1430	5/24	1700
Completion			5/24	1700

WELL DESIGN & SPECIFICATIONS

COMMENTS

DEPTH	STRING(S)
0	7
7	15
6	16
0	6

5X50 LB BAGS SAND
2X50 LB BAGS BENTONITE

Protective Casing **N/A**

Casing **2" SCHEDULE 40 PVC**

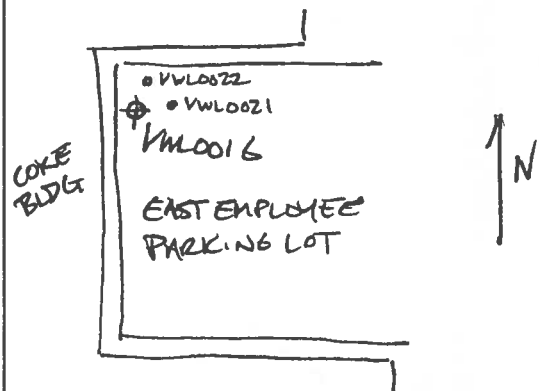
Screen **0.020" SLOTTED**
2" SCH. 40 PVC

Filter Pack **CEMEX 'LAPIS LUSTRE'**
#2/12 MONTEREY SAND

Bentonite **ENV-0-BEN ENVIRONMENTAL**

Grout **N/A**

LOCATION DIAGRAM



0

BENTONITE

6.0

7.0

SAND

15.0

16.0

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID

VWLD0017 (WELL ID: SYE-1B)

Date

5/24/2017

Easting

Northing

Ground Level Elevation

Geologist

R. SHORE / C. ECKERT

Top of Casing Elevation

BORING SUMMARY

Total Depth

43.0' BGS

Pilot Borehole Diameter

7 1/4"

Reamed Diameter

N/A

Casing Stick-Up Height

0

Drilling Co/Driller

GREGG DRILLING / BRANDON MAPLE

Rig

FRASER XL MAX 250 SONIC

Bit(s)

7" OD CORE BARREL

Drilling Fluid

N/A

WELL DESIGN & SPECIFICATIONS

DEPTH

STRING(S)

0

20

2" BLANK SCH 40 PVC

20

42

2" SLOTTED 0.020" SCH 40 PVC

18.5

43

#2/12 MONTEREY SAND

0

18.5

BENTONITE CHIPS

Protective Casing

N/A

Casing

2" SCHEDULE 40 PVC

Screen

0.020" SLOTTED

2" SCH. 40 PVC

Filter Pack

CEMEX 'LAPIS LUSTRE'

#2/12 MONTEREY SAND

Bentonite

WYO-BEN ENVIROPLUG
MEDIUM CHIPS

Grout

N/A

CONSTRUCTION TIME LOG

TASK

DATE

TIME

DATE

TIME

Drilling

5/24

0915

5/24

1000

Casing

5/24

1005

5/24

1010

Filter Pack Placement

5/24

1010

5/24

1030

BENTONITE SEAL

5/24

1030

5/24

1040

Well

FLUSH MOUNT BOX

5/24

1045

5/24

1100

Completion

5/24

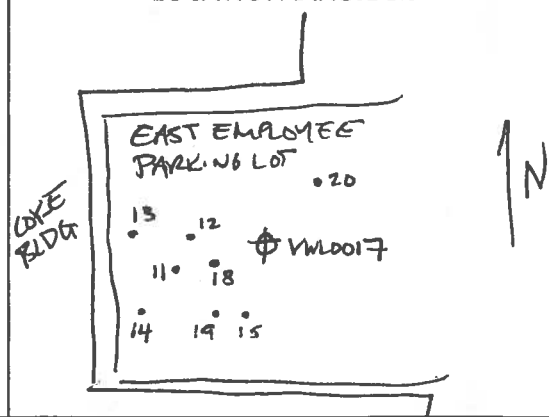
1110

COMMENTS

10 x 50 lb BAGS SAND

6 x 50 lb BAGS BENTONITE

LOCATION DIAGRAM



18.5

20.0

42.0

43.0

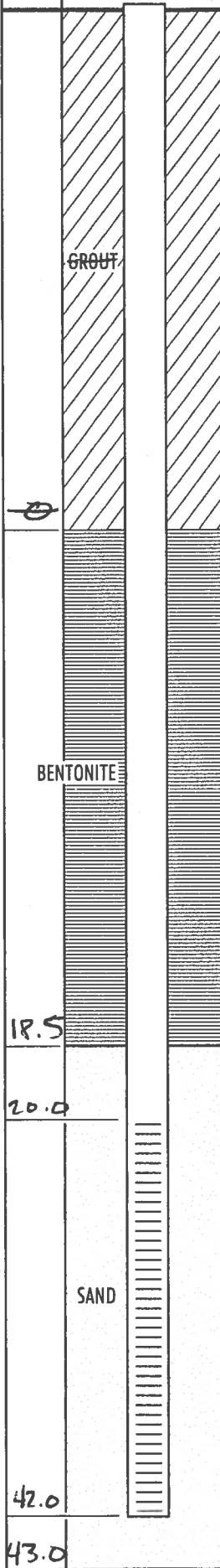
SAND

GROUT

BENTONITE

WELL CONSTRUCTION DIAGRAM

DEPTH CASING



Location ID
VW0018 (WELL ID: VM-1B)

Easting
Northing

Geologist
R. SHORE / C. ECKERT

Date
5/25/2017

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth
43.0' BGS

Pilot Borehole Diameter
7 1/4"

Reamed Diameter
N/A

Casing Stick-Up Height
0

Drilling Co/Driller
GREEN DRILLING / BRANDON MAPLE

Rig
FRATE XLMAX 250 SONIC

Bit(s)
7" OD CORE BARREL

Drilling Fluid
N/A

CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling	5/25	1055	5/25	1150
Casing	5/25	1150	5/25	1155
Filter Pack Placement	5/25	1155	5/25	1205
BENTONITE SEAL	5/25	1205	5/25	1215
Well				
FLUSH MOUNT BOX	5/25	1500	5/25	1520
Completion			5/25	1520

WELL DESIGN & SPECIFICATIONS

DEPTH	STRING(S)
0	20
20	42
18.5	43
0	18.5

COMMENTS

10 x 50lb BAGS SAND

6 x 50lb BAGS BENTONITE

Protective Casing
N/A

Casing
2" SCHEDULE 40 PVC

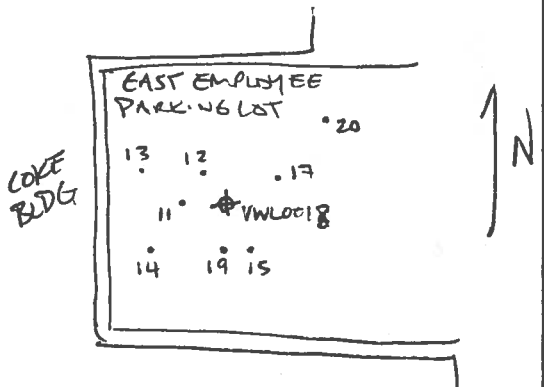
Screen
0.020" SLOTTED
2" SCH. 40 PVC

Filter Pack
CEMEX 'LAPIS LUSTRE'
#2/12 MONTEREY SAND

Bentonite
WYOM-BEN ENVIROPLUG
MEDIUM CHIPS

Grout
N/A

LOCATION DIAGRAM



WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID

VML0019 (WELL ID: VM-2B)

Easting

Northing

Geologist

R. SHORE / C. ECKERT

Date

5/25/2017

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth

43.0' BGS

Pilot Borehole Diameter

7 1/4"

Reamed Diameter

N/A

Casing Stick-Up Height

0

Drilling Co/Driller

GREEN DRILLING

Rig

FRASER XLMAX 250 SONIC

Bit(s)

7" OD CORE BARREL

Drilling Fluid

N/A

WELL DESIGN & SPECIFICATIONS

DEPTH

STRING(S)

0

20

2" BLANK SCH 40 PVC

20

42

2" SLOTTED 0.020" SCH 40 PVC

19

43

#2 1/2 MONTEREY SAND

0

19

BENTONITE CHIPS

Protective Casing

N/A

Casing

2" SCHEDULE 40 PVC

Screen

0.020" SLOTTED

2" SCH. 40 PVC

Filter Pack

CEMEX 'LAPIS LUSTRE'

#2 1/2 MONTEREY SAND

Bentonite

WYOMING ENVIRONMENTAL
MEDIUM CHIPS

Grout

N/A

CONSTRUCTION TIME LOG

TASK

DATE

TIME

DATE

TIME

Drilling

5/25

0730

5/25

0815

Casing

5/25

0815

5/25

0820

Filter Pack Placement

5/25

0820

5/25

0830

BENTONITE SEAL

5/25

0830

5/25

0840

Well

0830

FLUSH MOUNT BOX

5/25

1410

5/25

1430

Completion

5/25

1430

COMMENTS

9.5 x 50 LB BAGS SAND

6 x 50 LB BAGS BENTONITE

LOCATION DIAGRAM

EAST EMPLOYEE
PARKING LOT

N

CORE BLDG

VML0014
VML0019
VML0015

19.0

20.0

42.0

43.0

GROUT

BENTONITE

SAND

WELL CONSTRUCTION DIAGRAM																																																								
DEPTH	CASING																																																							
<div style="text-align: center;"> </div>	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Location ID VWLOO20 (WELLID: VM-3B)</p> <p>Easting _____ Northing _____</p> <p>Geologist R. SHORE / C. ECKERT</p> <p style="text-align: center;">BORING SUMMARY</p> <p>Total Depth 43.0' BGS</p> <p>Pilot Borehole Diameter 7 1/4"</p> <p>Reamed Diameter N/A</p> <p>Casing Stick-Up Height 0</p> <p>Drilling Co/Driller GREEN DRILLING / BRANDON MAPE</p> <p>Rig FRASER XLMAX 250 SONIC</p> <p>Bit(s) 7" OD CORE BARREL</p> <p>Drilling Fluid N/A</p> <p style="text-align: center;">WELL DESIGN & SPECIFICATIONS</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">DEPTH</th> <th>STRING(S)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">19</td> <td>2" BLANK SCH. 40 PVC</td> </tr> <tr> <td style="text-align: center;">19</td> <td style="text-align: center;">41</td> <td>2" SLOTTED 0.020" SCH. 40 PVC</td> </tr> <tr> <td style="text-align: center;">18</td> <td style="text-align: center;">43</td> <td>#2/12 MONTEREY SAND</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">18</td> <td>BENTONITE SEAL</td> </tr> </tbody> </table> <p>Protective Casing N/A</p> <p>Casing 2" SCHEDULE 40 PVC</p> <p>Screen 0.020" SLOTTED 2" SCH. 40 PVC</p> <p>Filter Pack CEMEX 'LAPIS LUSTRE' #2/12 MONTEREY SAND</p> <p>Bentonite WMA-BEN ENVIROPLUG MEDIUM CHIPS</p> <p>Grout N/A</p> </div> <div style="width: 35%;"> <p>Date 5/25/2017</p> <p>Ground Level Elevation _____</p> <p>Top of Casing Elevation _____</p> <p style="text-align: center;">CONSTRUCTION TIME LOG</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>TASK</th> <th>DATE</th> <th>TIME</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td>Drilling</td> <td>5/25</td> <td>0910</td> <td>5/25</td> <td>0950</td> </tr> <tr> <td>Casing</td> <td>5/25</td> <td>0950</td> <td>5/25</td> <td>0955</td> </tr> <tr> <td>Filter Pack Placement</td> <td>5/25</td> <td>0955</td> <td>5/25</td> <td>1010</td> </tr> <tr> <td>BENTONITE SEAL</td> <td>5/25</td> <td>1010</td> <td>5/25</td> <td>1025</td> </tr> <tr> <td>Well</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FLUSH MOUNT BOX</td> <td>5/25</td> <td>1440</td> <td>5/25</td> <td>1500</td> </tr> <tr> <td>Completion</td> <td></td> <td></td> <td>5/25</td> <td>1500</td> </tr> </tbody> </table> <p style="text-align: center;">COMMENTS</p> <p>10 x 50 lb BAGS SAND</p> <p>6 x 50 lb BAGS BENTONITE</p> <p>WELL WAS INITIALLY SET @ 42.0' BGS, BUT WHILE TRIPPING OUT DRILL PIPE THE WELL WAS PULLED UP ~1 FOOT. CONFIRMED W/ PM THAT NEW SCREEN FROM 19'-41' BGS WAS ACCEPTABLE. SET WELL @ _____' BGS.</p> <p style="text-align: center;">LOCATION DIAGRAM</p> <div style="text-align: center;"> </div> </div> </div>	DEPTH		STRING(S)	0	19	2" BLANK SCH. 40 PVC	19	41	2" SLOTTED 0.020" SCH. 40 PVC	18	43	#2/12 MONTEREY SAND	0	18	BENTONITE SEAL	TASK	DATE	TIME	DATE	TIME	Drilling	5/25	0910	5/25	0950	Casing	5/25	0950	5/25	0955	Filter Pack Placement	5/25	0955	5/25	1010	BENTONITE SEAL	5/25	1010	5/25	1025	Well					FLUSH MOUNT BOX	5/25	1440	5/25	1500	Completion			5/25	1500
DEPTH		STRING(S)																																																						
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BENTONITE SEAL	5/25	1010	5/25	1025																																																				
Well																																																								
FLUSH MOUNT BOX	5/25	1440	5/25	1500																																																				
Completion			5/25	1500																																																				

WELL CONSTRUCTION DIAGRAM

DEPTH CASING

Location ID **VWL0021 (WELL ID: VM-4B)**

Easting

Northing

Geologist **P. SHORE / C. ECKERT**

Date **5/24/2017**

Ground Level Elevation

Top of Casing Elevation

BORING SUMMARY

Total Depth **43.0' BGS**

Pilot Borehole Diameter **7 1/4"**

Reamed Diameter **N/A**

Casing Stick-Up Height **0**

Drilling Co/Driller **GREEN DRILLING / BRANDON MAPLE**

Rig **FRASTE XLMAX 250 SONIC**

Bit(s) **7" OD CORE BARREL**

Drilling Fluid **N/A**

CONSTRUCTION TIME LOG

TASK	DATE	TIME	DATE	TIME
Drilling	5/24	1300	5/24	1315
Casing	5/24	1315	5/24	1320
Filter Pack Placement	5/24	1320	5/24	1325
BENTONITE SEAL	5/24	1325	5/24	1330
Well				
FLUSH MOUNT BOX	5/24	1630	5/24	1700
Completion	5/24	1700	5/24	1700

WELL DESIGN & SPECIFICATIONS

DEPTH	STRING(S)
0	20
20	42
18.5	43
0	18.5

Protective Casing **N/A**

Casing **2" SCHEDULE 40 PVC**

Screen **0.020" SLOTTED SCH. 40 PVC**

Filter Pack **CEMEX 'LAPIS LUSTRE' #2/12 MONTEREY SAND**

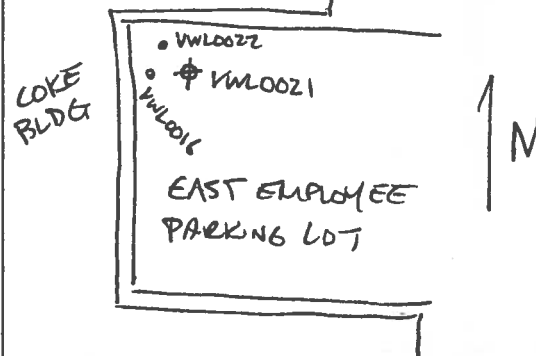
Bentonite **WYO-BEN ENVIRONMENTAL MEDIUM CHIPS**

Grout **N/A**

COMMENTS

10 x 50 lb BAGS SAND
6 x 50 lb BAGS BENTONITE

LOCATION DIAGRAM



0

BENTONITE

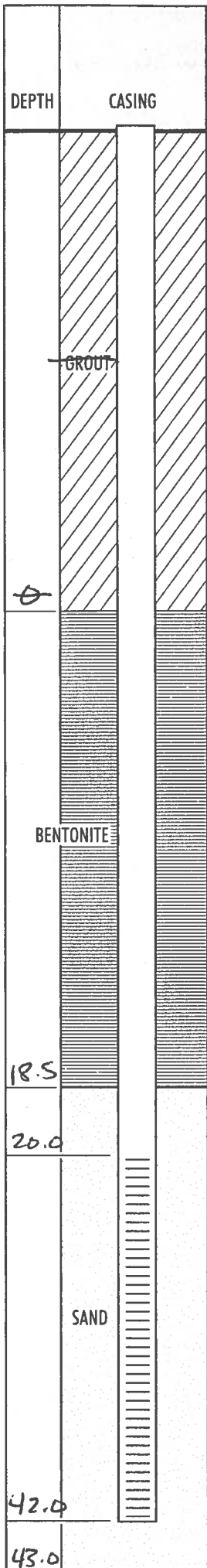
18.5

20.0

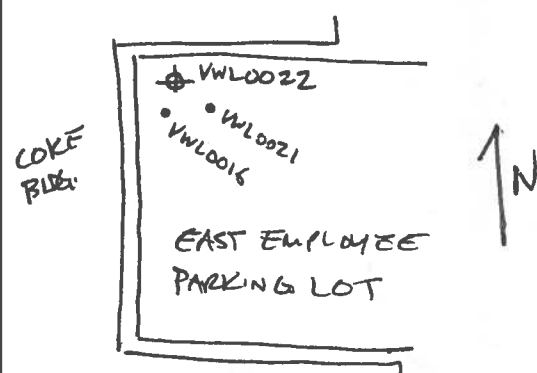
SAND

42.0

43.0



WELL CONSTRUCTION DIAGRAM

Location ID VWL0022 (WELL ID: VM-5B)		Date 5/24/2017	
Easting		Northing	
Geologist R. SHORE / C. ECKERT		Ground Level Elevation	
		Top of Casing Elevation	
BORING SUMMARY		CONSTRUCTION TIME LOG	
Total Depth 43.0' BGS			
Pilot Borehole Diameter 7 1/4"		Drilling 5/24 1350 5/24 1440	
Reamed Diameter N/A			
Casing Stick-Up Height 0			
Drilling Co/Driller GREEN DRILLING / BRANDON MAPLE		Casing 5/24 1445 5/24 1450	
Rig FRASTE XL250 MAX SONIC			
Bit(s) 7" OD CORE BARREL		Filter Pack Placement 5/24 1450 5/24 1500	
Drilling Fluid N/A		BENTONITE SEAL 5/24 1500 5/24 1510	
		Well 1	
		FLUSH MOUNT BOX 5/24 1430 5/24 1700	
		Completion 5/24 1700	
WELL DESIGN & SPECIFICATIONS		COMMENTS	
DEPTH		STRING(S)	
0	20	2" BLANK SCH 40 PVC	
20	42	2" SLOTTED 0.020" SCH 40 PVC	
18.5	43	#2 1/2 MONTEREY SAND	
0	18.5	BENTONITE CHIPS	
Protective Casing N/A		6 x 50 lb BAGS BENTONITE	
Casing 2" BLANK SCHEDULE 40 PVC		10 x 50 lb BAGS SAND	
Screen 0.020" SLOTTED 2" SCH. 40 PVC			
Filter Pack CEMEX 'LAPIS LUSTRE' #2 1/2 MONTEREY SAND			
Bentonite WYOMEN ENVIRONMENTAL MEDIUM CHIPS			
Grout N/A		LOCATION DIAGRAM	
			

ATTACHMENT 2
CalClean Unit SCAQMD Permit



Soil and Groundwater Contamination Extraction and Treatment Services

TECHNICAL SPECIFICATIONS

TYPICAL OXIDIZER

System Information

Description	Thermal/Catalytic Oxidizer
Manufacturer	Soleco
Model No.	500

Chamber & Stack Specification

Chamber Length	9 feet
Chamber Dimensions	30" outside / 20" inside
Chamber Internal Lining	Ceramic Fiber
Chamber Retention Time	1.1 seconds
Throat Velocity	40 feet / second
Stack Exit Velocity	30 feet / second
Stack Discharge Height	13 + feet
Stack Dimensions	18" Round
Destruction Efficiency	99% +

Influent and Effluent

Maximum VOC Influent "Thermal"	30,000 PPMV
Normal VOC Effluent "Thermal"	< 50 PPMV ROC
Maximum VOC Influent "Catalytic"	3000 PPMV
Normal VOC Effluent "Catalytic"	< 50 PPMV ROC

Burner Specification

Manufacturer/Model	Eclipse / ThermAir
Burner Rating (Factory Rated)	400,000 BTU/hour (maximum)
Operating Temperature "Thermal"	1,400° to 1,800°
Operating Temperature "Catalytic"	600° to 1,150°
Combustion Air Blower	Burner Fan
Combustion Air Blower Flow	Up to 88 CFM

Blower Specification

Manufacturer/Model	Dekker / Vmax System VMX-0453K
Blower Type	Single Stage Liquid Ring pump
Volumetric Flow (Factory Rated)	410 CFM maximum
Vacuum	Up to 28" Mercury
Motor Type	25 hp / TEFC / 230 Volt / 3 phase

Catalyst Specification

Manufacturer/Model	Sud-Chemie / EnviCat 2310, MS 300C
Catalyst Type	Platinum Coated Metal Monolithic
Catalyst Size	18" OD x 3.5" Height
Catalyst Volume	.55 FT ³
Destruction Efficiency	99% +

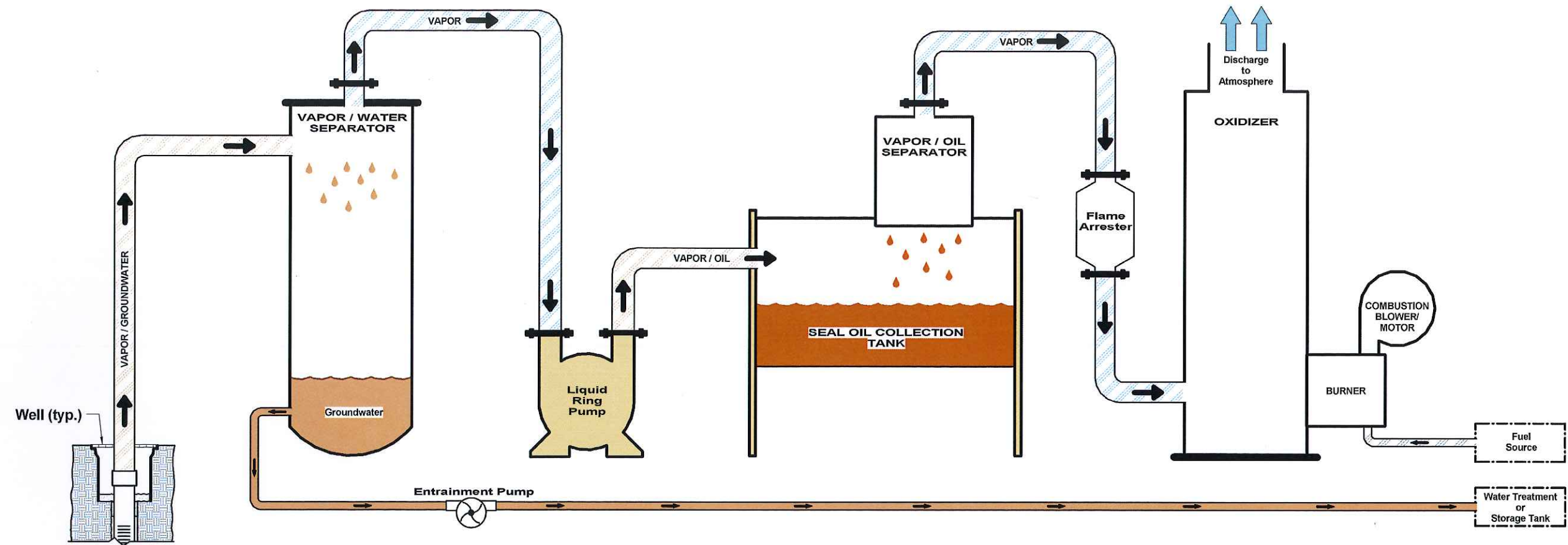
Utility Specification

Supplemental Fuel	Natural Gas or Propane
Fuel Pressure	5 psi
Fuel Volume	160 CFH (at 400,000 BTU)
Electrical Requirements Option-1	230 Volt / 1 Phase / 125 Amp
Electrical Requirements Option-2	230 Volt / 3 Phase / 100 Amp

Process Flow of a Typical CalClean Mobile Remediation System (MRS)



1700 N. CASE STREET ORANGE, CA 92665, US
714-936-2706 • www.calclean.com



① CLCL-PFD-TYP-Thermal (C) (DV)

THERMAL / CATALYTIC

LEGAL NOTICE: This is the intellectual property of CalClean, Inc. This design is proprietary and patent pending. It is for use by CalClean's customers for review purposes only.

Designed By: Gordon Melin

Drafted By: Power & Data

Approved By: Gordon Melin

Print Date: 10/6/2016 8:58:16 AM

Process Flow Diagram

TYP-2.2

MTSv4



PERMIT TO CONSTRUCT/OPERATE

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for annual renewal fee (Permit No. 1) is not received by the applicant, then, the District

LEGAL OWNER
OR OPERATOR:

CALCLEAN INC
3002 DOW AVE SUITE 142
TUSTIN, CA 92780

ID 121407

Equipment Location: VARIOUS LOCATIONS IN SCAQMD

Equipment Description:

SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM CONSISTING OF:

1. VAPOR EXTRACTION WELLS.
2. WATER SEPARATOR.
3. EXTRACTION BLOWER, 500 SCFM MAXIMUM FLOW RATE.
4. CATALYTIC/THERMAL OXIDIZER UNIT, SOLLECO, MODEL 500, SERIAL NO. M1047, CONSISTING OF:
 - (A) CATALYTIC OXIDIZER, PLATINUM CATALYST ON STAINLESS STEEL MONOLITH TYPE, ELECTRICALLY HEATED, 80 KW, OR DIRECT GAS-FIRED, 1,500,000 BTU PER HOUR, WITH NATURAL GAS OR LPG AS SUPPLEMENTAL FUEL, AN INTEGRAL HEAT EXCHANGER, A COMBUSTION BLOWER WITH A MAXIMUM FLOW RATE OF 125 SCFM, AND AN AUTOMATIC TEMPERATURE CONTROL SYSTEM.
 - (B) THERMAL OXIDIZER, DIRECT GAS-FIRED ONLY, WITH AN AUTOMATIC TEMPERATURE CONTROL SYSTEM.

Conditions:

- 1) OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
- 2) THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
- 3) CURRENT CONTACT PERSON NAME, COMPANY, AND PHONE NUMBER SHALL BE DISPLAYED IN A PERMANENT AND CONSPICUOUS POSITION.

ORIGINAL



PERMIT TO CONSTRUCT/OPERATE

CONTINUATION OF PERMIT TO CONSTRUCT/OPERATE

- 4) UPON COMPLETION ANY VAPOR EXTRACTION WELLS AND DUCTS SHALL BE CAPPED TO PREVENT VAPORS FROM VENTING TO THE ATMOSPHERE. VAPORS SHALL NOT BE EXTRACTED FROM THE SOIL UNLESS THEY ARE VENTED TO THE VAPOR CONTROL SYSTEM.
 - 5) AN IDENTIFICATION TAG OR NAME PLATE SHALL BE DISPLAYED ON THE EQUIPMENT TO SHOW MANUFACTURER MODEL NO. AND SERIAL NO. THE TAG(S) OR PLATE(S) SHALL BE ISSUED BY THE MANUFACTURER AND SHALL BE ADHERED TO THE EQUIPMENT IN A PERMANENT AND CONSPICUOUS POSITION.
 - 6) A FLOW INDICATOR SHALL BE INSTALLED AND MAINTAINED AT ALL INLET STREAMS TO THE VAPOR CONTROL SYSTEM TO INDICATE THE TOTAL AIR FLOW RATE IN CUBIC FEET PER MINUTE (CFM). THE TOTAL FLOW RATE SHALL NOT EXCEED 625 CFM. IN CASE A PRESSURE SENSOR DEVICE IS USED IN PLACE OF THE FLOW INDICATOR, A CONVERSION CHART SHALL BE AVAILABLE TO INDICATE THE CORRESPONDENT FLOW RATE, IN CFM, TO THE PRESSURE READING.
 - 7) UPON THE FIFTH DAY AFTER PLACEMENT OF THIS EQUIPMENT INTO OPERATION AT A NEW SITE, THE DISTRICT SHALL BE NOTIFIED VIA PHONE AT 1-877-810-6995 OF THE EXACT NATURE OF THE PROJECT AS FOLLOWS:
 - (A) THE PERMIT NUMBER OF THE PORTABLE EQUIPMENT.
 - (B) THE NAME AND PHONE NUMBER OF A CONTACT PERSON.
 - (C) THE LOCATION WHERE THE PORTABLE EQUIPMENT WILL BE OPERATED.
 - (D) THE ESTIMATED TIME THE PORTABLE EQUIPMENT WILL BE LOCATED AT THE SITE.
 - (E) DESCRIPTION OF THE PROJECT.
 - (F) IF LESS THAN 1/4 MILE, THE DISTANCE TO THE NEAREST SENSITIVE RECEPTOR, DEFINED AS: LONG-TERM HEALTH CARE FACILITIES, REHABILITATION CENTERS, CONVALESCENT CENTERS, RETIREMENT HOMES, RESIDENCES, SCHOOLS, PLAYGROUNDS, CHILD CARE CENTERS, AND ATHLETIC FACILITIES.
- IN CASE OF A VENT TEST, THE DISTRICT SHALL BE NOTIFIED 24 HOURS PRIOR TO THE OPERATING OF THE EQUIPMENT.
- 8) THIS EQUIPMENT SHALL NOT BE OPERATED MORE THAN TWELVE CONSECUTIVE MONTHS AT ANY ONE FACILITY WITHIN THE SCAQMD.
 - 9) VOLATILE ORGANIC COMPOUND (VOC) CONCENTRATION SHALL BE MEASURED AT THE OUTLET OF THE VAPOR CONTROL SYSTEM SHALL BE MEASURED PARTS PER MILLION BY VOLUME (PPMV) AT LEAST ONCE EVERY 7 OPERATING DAYS BY USING A FLAME IONIZATION DETECTOR OR A DISTRICT APPROVED ORGANIC VAPOR ANALYZER CALIBRATED IN PARTS PER MILLION BY VOLUME (PPMV) AS HEXANE (IF ANOTHER CALIBRATING AGENT WAS USED. IT SHALL BE CORRELATED TO AND EXPRESSED AS HEXANE).
 - 10) THIS EQUIPMENT SHALL NOT BE OPERATED WITHIN 1000 FEET FROM AN OUTSIDE BOUNDARY OF ANY SCHOOL.
 - 11) VOC CONCENTRATION AT THE OUTLET OF THE OXIDIZER SHALL NOT EXCEED 50 PPMV AS HEXANE.

ORIGINAL



PERMIT TO CONSTRUCT/OPERATE

CONTINUATION OF PERMIT TO CONSTRUCT/OPERATE

- 12) A TEMPERATURE MEASUREMENT AND RECORDING DEVICE WITH AN ACCURACY OF PLUS OR MINUS 20 DEGREES FAHRENHEIT SHALL BE INSTALLED AND MAINTAINED AT THE OUTLET OF THE COMBUSTION CHAMBER OF THE THERMAL OXIDIZER.
- 13) WHENEVER THE THERMAL OXIDIZER IS IN OPERATION THE TEMPERATURE AT THE OUTLET OF THE COMBUSTION CHAMBER OF THE THERMAL OXIDIZER (AS SHOWN ON THE INSTRUMENT DESCRIBED UNDER CONDITION NO. 11) SHALL NOT BE LESS THAN 1400 DEGREES FAHRENHEIT.
- 14) EQUIPMENT SHUTDOWN INTERLOCKS SHALL BE PROVIDED FOR LOW OXIDATION TEMPERATURE (CONDITION NO. 12).
- 15) TEMPERATURE MEASUREMENT AND RECORDING DEVICE WITH AN ACCURACY OF PLUS OR MINUS 20 DEGREES FAHRENHEIT SHALL BE INSTALLED AND MAINTAINED AT THE INLET OF THE FIRST STAGE CATALYTIC BED.
- 16) WHENEVER THE CATALYTIC OXIDIZER IS IN OPERATION, THE TEMPERATURE AT THE INLET OF THE FIRST STAGE OF THE CATALYTIC BED (AS SHOWN ON THE INSTRUMENT DESCRIBED UNDER CONDITION NO. 14) SHALL NOT BE LESS THAN 600 DEGREES FAHRENHEIT.
- 17) EQUIPMENT SHUTDOWN INTERLOCKS SHALL BE PROVIDED FOR LOW OXIDATION TEMPERATURE (CONDITION NO. 15).
- 18) THIS EQUIPMENT SHALL ONLY BE USED TO EXTRACT AND TREAT NON-CHLORINATED PETROLEUM HYDROCARBON VAPORS. THIS SHALL BE DEMONSTRATED BY AN ONSITE SOIL CHARACTERIZATION ANALYSIS REPORT OR GRAB SAMPLE ANALYSIS.
- 19) RECORDS SHALL BE MAINTAINED TO PROVE COMPLIANCE WITH CONDITIONS 6, 7, 8, 9, 10, 12, 15, AND 17. THE RECORDS SHALL BE KEPT FOR AT LEAST TWO YEARS AND MADE AVAILABLE TO THE DISTRICT PERSONNEL UPON REQUEST.

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

ORIGINAL



AQMD

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive, Diamond Bar, CA 91765

PERMIT TO CONSTRUCT/OPERATE

page 4
Permit No.
F24496
A/N 366359

PERMIT TO CONSTRUCT/OPERATE

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M. Bailey

By Dorris M. Bailey/wc01
2/23/2000

ORIGINAL

ATTACHMENT 3

AKI Engineering Test Report

ENGINEERING TEST REPORT

COCA-COLA DISTRIBUTION, PROPERTY 23 PILOT SVE USING PORTABLE THERMAL OXIDIZER (PTO)

Source Location:

**Coca-Cola Distribution, Property 23
19875 Pacific Gateway Dr.
Torrance, California 90502**

Test Date: April 4-6 & 11-13, 2018

Issue Date: July 11, 2018

Prepared for:

**AECOM
130 Robin Hill Road
Santa Barbara, California 93117**

Prepared by:

**AirKinetics, Inc.
1308 S. Allec Street
Anaheim, California 92805
(714) 254-1945 Fax: (714) 956-2350
AKI No.: 14875**



ENGINEERING TEST REPORT

COCA-COLA DISTRIBUTION, PROPERTY 23 PILOT SVE USING PORTABLE THERMAL OXIDIZER (PTO)

Test Date: April 4-6 & 11-13, 2018
Issue Date: July 11, 2018

Prepared for:
AECOM
130 Robin Hill Road
Santa Barbara, California 93117

Prepared by:
AirKinetics, Inc.
AKI No.: 14875

Prepared By:



Jason Mai
Report Writer

Reviewed By:



Tony Wong
President

AirKinetics, Inc. operated in conformance with the requirements set forth in ASTM D7036-04 and AirKinetics' Quality Manual during this test project.

Certified By:



Tony Wong
President

TABLE OF CONTENTS

	<u>Page</u>
1.0 SUMMARY	3
1.1 Source Information.....	3
1.2 Testing Firm Information	3
1.3 Test Information	3
1.4 Subcontractors	4
2.0 TEST RESULTS AND DATA PRESENTATION	5
3.0 INTRODUCTION	7
4.0 SOURCE PROCESS AND EQUIPMENT DESCRIPTION	8
4.1 Process Description	8
4.2 Location Description	8
4.3 Process Operation.....	8
5.0 SAMPLING AND ANALYTICAL PROCEDURES.....	9
6.0 TEST CRITIQUE.....	10
 APPENDICES	
 A. DIOXINS/ FURANS (PTO STACK)	
1.0 Results Tabulation and Calculations.....	11
2.0 Field Data.....	25
3.0 Analytical Data	37
4.0 Equipment Calibrations	65
 B. DIOXINS/ FURANS (BACKGROUND)	
1.0 Results Tabulation and Calculations.....	71
2.0 Field Data.....	87
3.0 Analytical Data	97
 C. SAMPLING METHOD DESCRIPTION AND SCHEMATICS	 119
 D. AETB AND QI CERTIFICATIONS	 127
 E. DIOXINS/FURANS RAW ANALYTICAL DATA (CD-ROM)	 131

1.0 SUMMARY

1.1 Source Information

Plant Name and Address: Coca-Cola Distribution, Property 23
19875 Pacific Gateway Dr.
Torrance, California 90502

Source Tested: Pilot SVE Using Portable Thermal Oxidizer (PTO)

Plant Contact: Margaret Pittman
805-692-0681
margaret.pittman@aecom.com

1.2 Testing Firm Information

Firm Name and Address: AirKinetics, Inc.
1308 S. Allec Street
Anaheim, California 92805

Firm Contact: Neal Conroy
714-254-1945 ext. 210
conroy@airkineticsinc.com

Test Personnel: Morgan Nguyen, Project Supervisor
Randy Vorick, Team Leader
Catarino Ocegueda, Team Leader

1.3 Test Information

Test Requested By: AECOM

Firm Contact: Pittman Margaret
805-692-0681
margaret.pittman@aecom.com

Test Objective: To measure dioxins/furans emissions from PTO stack and levels in ambient background

Test Date: April 4-6 & 11-13, 2018

Test Methods:

EPA 1	Traverse Points
EPA 2	Velocity
Portable Analyzer	O ₂ and CO ₂
EPA 4	Moisture Content
EPA TO-9	Dioxins/Furans
CARB 428	Dioxins/Furans

1.4 Subcontractors:

Laboratory Name:	Vista Analytical
CARB Method 428 and	Martha Maier
EPA Method TO-19	916-673-1520

2.0 TEST RESULTS AND DATA PRESENTATION

The test program results are summarized in Tables 2-1 through 2-3. All data pertaining to the tests are included in the appendices to this report. Dioxins/Furans (PTO Stack) results tabulation and calculations, field data, analytical data, and equipment calibration are presented in Appendix A. Dioxins/Furans (Background) is presented in Appendix B. The sampling method descriptions and schematic is presented in Appendix C. AETB and QI Certifications are presented in Appendix D. Dioxins/Furans raw analytical data located in CD-ROM is presented in Appendix E.

TABLE 2-1
PTO STACK SVE1A TEST RESULTS

PARAMETER	UNIT	RUN 1	RUN 2	RUN 3	AVERAGE
Run Duration	hr	4	4	4	
End Date	m/d/yr	4/4/18	4/5/18	4/6/18	
End Time	hr:min	12:10	12:41	11:29	
Total PCDDs/PCDFs	ng/dscm	0.138	0.730	0.0588	0.309
	lbs/ hr	5.15E-11	2.56E-10	2.04E-11	1.09E-10
Flow Rate	dscfm	100	93.7	92.8	95.5

TABLE 2-2
PTO STACK SVE1B TEST RESULTS

PARAMETER	UNIT	RUN 1	RUN 2	RUN 3	AVERAGE
Run Duration	hr	4	4	4	
End Date	m/d/yr	4/11/18	4/12/18	4/13/18	
End Time	hr:min	10:02	11:34	11:36	
Total PCDDs/PCDFs	ng/dscm	0.0359	0.0130	0.0128	0.0206
	lbs/ hr	1.74E-11	6.34E-12	6.24E-12	9.99E-12
Flow Rate	dscfm	129	152	151	144

TABLE 2-3
BACKGROUND TEST RESULTS

PARAMETER	UNIT	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7
Run Duration	hr	24	24	24	24	24	24
End Date	m/d/yr	4/5/18	4/6/18	4/10/18	4/11/18	4/12/18	4/13/18
End Time	hr:min	11:35	11:45	10:25	10:35	10:40	10:45
Total PCDDs/PCDFs	ng/m ³	8.59E-04	6.91E-05	1.43E-04	1.56E-03*	1.02E-03	1.10E-03

* Concentration may be biased high (see the explanation in Section 6.0, Test Critique).

3.0 INTRODUCTION

On April 4-6 & 11-13, 2018, AirKinetics, Inc. conducted a test program for AECOM in Torrance, California. The test objective was to measure dioxins/furans emissions from PTO stack and levels in ambient background. Testing was conducted on a Pilot SVE Using Portable Thermal Oxidizer (PTO).

4.0 SOURCE PROCESS AND EQUIPMENT DESCRIPTION

4.1 Process Description

Two pilot tests (one at shallow soil; referred as 1A and the other at deep soil; referred as 1B) were performed on the soil-vapor (SVE) extraction system at the Coca-Cola Distribution Center in Torrance, California (Property 23) using a portable thermal oxidizer for remediation.

4.2 Location Description

A summary of the test location information is presented in Table 4-1. Sampling location schematics are presented in Appendix A.2.0.

TABLE 4-1
TEST LOCATION INFORMATION

Location	Dimensions (inches)	Cross Sectional Area (in ²)	Downstream Disturbance		Upstream Disturbance	
			Inches	Equivalent Diameter	Inches	Equivalent Diameter
PTO Exhaust	9.88 ID	76.6	24	2.43	12	1.22

4.3 Process Operation

The process was operated normally.

5.0 SAMPLING AND ANALYTICAL PROCEDURES

A list of the sampling and analytical procedures employed during this test program is presented in Table 5-1. Sampling method descriptions and schematics are presented in Appendix C.

TABLE 5-1
SAMPLING AND ANALYTICAL PROCEDURES

Parameter	Test Method
Traverse Points	EPA 1
Velocity	EPA 2
O ₂ and CO ₂	Portable Testo Analyzer
Moisture	EPA 4
Dioxins/Furans	EPA TO-9 and CARB 428

6.0 TEST CRITIQUE

The Run 1 ambient background test was invalidated due to use of a filter of insufficient diameter.

The extraction glassware containing sample "A-MT09-5" developed a crack early in the extraction process at the subcontracted laboratory and a significant amount of the extract was lost. The sample was transferred to new glassware and the extraction was re-started. The pre-spike recoveries are high for this sample, indicating that extract was lost prior to a thorough extraction of the PUF; the reported concentrations of the analyses may be biased high.

No other anomalies occurred during this test program.

APPENDIX A
DIOXINS/FURANS (PTO STACK)

1.0 Results Tabulation and Calculations

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ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

Client Name	AECOM	Operator		MN RV
Plant Name	COCA-COLA	Project #		14875
Sampling Location	STACK SVE1A	Standard Temperature, °F		68

USE IN AVERAGE OF RUN SET? 1 or 0 =>		1	1	1	SET AVERAGE
Run Number		S-1A-M428-1	S-1A-M428-2	S-1A-M428-3	
Run Date		04/04/18	04/05/18	04/06/18	
Run Start Time	hh:mm	802	835	725	
Run Stop Time	hh:mm	1210	1241	1129	
Meter Calibration Factor	Y	1.0000	1.0000	1.0000	
Pitot Tube Coefficient	C _p	0.84	0.84	0.84	
Actual Nozzle Diameter	in	0.751	0.746	0.751	
Sample Volume	ft ³	139.528	131.301	130.662	133.83
Total Sampling Time	min	240	240	240	240.00
Average Meter Temperature	°F	69.5	70.1	73.1	70.89
Average Stack Temperature	°F	989.2	1094.5	1100.8	1061.49
Barometric Pressure	in Hg	29.9	29.9	29.9	29.90
Stack/Duct Static Pressure	in H ₂ O	-0.02	-0.02	-0.02	-0.02
Absolute Stack/Duct Pressure	in Hg	29.9	29.9	29.9	29.90
Average Delta H	in H ₂ O	0.90	1.06	0.97	0.98
Absolute Meter Pressure	in Hg	30.0	30.0	30.0	29.97
Avg Differential Pressure (Delta P)	in H ₂ O	0.010	0.009	0.009	0.01
Total Water Volume Collected	mL	189.8	185.4	190.8	188.67
Volume of Water vapor @ STP	SCF	8.934	8.727	8.981	8.88
Volume Metered @ STP	DSCF	139.293	130.984	129.587	133.29
Calculated Stack Moisture	% H ₂ O	6.0	6.2	6.5	6.25
Saturated Stack Moisture	% H ₂ O	100.0	100.0	100.0	100.00
Reported Stack Moisture Content	% H ₂ O	6.0	6.2	6.5	6.25
Carbon Dioxide Percentage	% CO ₂	4.45	4.3	4.3	4.32
Oxygen Percentage	% O ₂	14.3	14.4	14.3	14.32
Carbon Monoxide Percentage	% CO	0.0	0.0	0.0	0.00
Nitrogen Percentage	% N ₂	81.2	81.4	81.5	81.36
Dry Mole Fraction	decimal	0.940	0.938	0.935	0.94
Dry Gas Molecular Weight	lb/lb-mole	29.28	29.23	29.25	29.26
Wet Stack Gas Molecular Weight	lb/lb-mole	28.60	28.55	28.52	28.56
Flue Gas Density	lb/ft ³	0.0742	0.0741	0.0740	0.07
Calculated Fuel Factor	F _o	1.48	1.53	1.56	1.52
F-Factor	DSCF/MM	9595	9595	9595	9595.00
Heat Input Rate	MMBtu/hr	0	0	0	0.19
Percent Excess Air	% EA	201.0	202.1	196.6	199.88
Stack Cross-Sectional Area	in ²	76.6	76.6	76.6	76.60
Stack Cross-Sectional Area	ft ²	0.53	0.53	0.53	0.53
Percent of Isokinetic Rate	% ISO	100.6	102.1	100.6	101.08
Air Flow Rate Results					0.00
Average Stack Gas Velocity	ft/sec	9.14	9.23	9.20	9.19
Dry Standard Stack Flow/Minute	DSCFM	100	93.7	92.8	95.47
Wet Standard Stack Flow/Minute	WSCFM	106	100	99	101.84

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

ANALYTICAL DATA			S-1A-M428-1		S-1A-M428-2		S-1A-M428-3		Conversion
	Compound	Unit	Pre	Amt	Pre	Amt	Pre	Amt	Factor
1	2,3,7,8-TCDD	pg	<	1.69	<	3.75	<	1.71	1E+12
2	Total TCDD	pg		10.1		65.9		9.14	1E+12
3	1,2,3,7,8-PeCDD	pg	<	2.69	<	12.7	<	2.86	1E+12
4	Total PeCDD	pg	<	16.8		66.9	<	8.87	1E+12
5	1,2,3,4,7,8-HxCDD	pg		4.71		6.59	<	3.25	1E+12
6	1,2,3,6,7,8-HxCDD	pg		5.50		10.0	<	3.12	1E+12
7	1,2,3,7,8,9-HxCDD	pg	<	4.19		8.63	<	3.18	1E+12
8	Total HxCDD	pg		80.1		98.1		17.6	1E+12
9	1,2,3,4,6,7,8-HpCDD	pg		43.7		38.2		13.4	1E+12
10	Total HpCDD	pg		92.2		71.5		24.8	1E+12
11	OCDD	pg		126		75.4	<	27.2	1E+12
12	2,3,7,8-TCDF	pg		8.42		62.4		6.95	1E+12
13	Total TCDF	pg		97.8		1450		74.2	1E+12
14	1,2,3,7,8-PeCDF	pg		8.97		69.2	<	2.59	1E+12
15	2,3,4,7,8-PeCDF	pg		4.73		24.4		2.74	1E+12
16	Total PeCDF	pg		75.4		574		37.3	1E+12
17	1,2,3,4,7,8-HxCDF	pg	<	5.45		46.1	<	1.60	1E+12
18	1,2,3,6,7,8-HxCDF	pg	<	5.76		52.5	<	2.44	1E+12
19	2,3,4,6,7,8-HxCDF	pg	<	1.49		39.5	<	1.27	1E+12
20	1,2,3,7,8,9-HxCDF	pg	<	1.69		7.49	<	1.44	1E+12
21	Total HxCDF	pg		21.9		3.15		8.95	1E+12
22	1,2,3,4,6,7,8-HpCDF	pg		16.3		80.7	<	3.30	1E+12
23	1,2,3,4,7,8,9-HpCDF	pg	<	1.59		17.3	<	1.73	1E+12
24	Total HpCDF	pg		16.3		127	<	3.30	1E+12
25	OCDF	pg		4.48		34.8	<	2.64	1E+12

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1A
 Run Number: S-1A-M428-1
 Run Date: 04/04/18
 Parameter Catch Weight

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	1.69	4.28E-04	1.16E-03	9.05E-04	2.02E-14	1.60E-13	
Other TCDD	8.41	2.13E-03	5.75E-03	4.50E-03	1.00E-13	7.97E-13	
1,2,3,7,8-PeCDD	2.69	6.82E-04	1.84E-03	1.44E-03	3.21E-14	2.55E-13	
Other PeCDD	14.11	3.58E-03	9.65E-03	7.56E-03	1.69E-13	1.34E-12	
1,2,3,4,7,8-HxCDD	4.71	1.19E-03	3.22E-03	2.52E-03	5.63E-14	4.47E-13	
1,2,3,6,7,8-HxCDD	5.5	1.39E-03	3.76E-03	2.95E-03	6.57E-14	5.22E-13	
1,2,3,7,8,9-HxCDD	4.19	1.06E-03	2.86E-03	2.24E-03	5.01E-14	3.97E-13	
Other HxCDD	65.7	1.67E-02	4.49E-02	3.52E-02	7.85E-13	6.23E-12	
1,2,3,4,6,7,8-HpCDD	43.7	1.11E-02	2.99E-02	2.34E-02	5.22E-13	4.14E-12	
Other HpCDD	48.5	1.23E-02	3.32E-02	2.60E-02	5.79E-13	4.60E-12	
OCDD	126	3.19E-02	8.61E-02	6.75E-02	1.51E-12	1.19E-11	
TOTAL PCDDs	325.20	8.24E-02	2.22E-01	1.74E-01	3.89E-12	3.08E-11	
PCDFs							
2,3,7,8-TCDF	8.42	2.13E-03	5.76E-03	4.51E-03	1.01E-13	7.98E-13	
Other TCDF	89.38	2.27E-02	6.11E-02	4.79E-02	1.07E-12	8.48E-12	
1,2,3,7,8-PeCDF	8.27	2.10E-03	5.65E-03	4.43E-03	9.88E-14	7.84E-13	
2,3,4,7,8-PeCDF	4.73	1.20E-03	3.23E-03	2.53E-03	5.65E-14	4.49E-13	
Other PeCDF	62.4	1.58E-02	4.27E-02	3.34E-02	7.46E-13	5.92E-12	
1,2,3,4,7,8-HxCDF	5.15	1.31E-03	3.52E-03	2.76E-03	6.15E-14	4.88E-13	
1,2,3,6,7,8-HxCDF	5.76	1.46E-03	3.94E-03	3.08E-03	6.88E-14	5.46E-13	
2,3,4,6,7,8-HxCDF	1.49	3.78E-04	1.02E-03	7.98E-04	1.78E-14	1.41E-13	
1,2,3,7,8,9-HxCDF	1.69	4.28E-04	1.16E-03	9.05E-04	2.02E-14	1.60E-13	
Other HxCDF	7.81	1.98E-03	5.34E-03	4.18E-03	9.33E-14	7.41E-13	
1,2,3,4,6,7,8-HpCDF	16.3	4.13E-03	1.11E-02	8.73E-03	1.95E-13	1.55E-12	
1,2,3,4,7,8,9-HpCDF	1.59	4.03E-04	1.09E-03	8.51E-04	1.90E-14	1.51E-13	
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
OCDF	4.48	1.14E-03	3.06E-03	2.40E-03	5.35E-14	4.25E-13	
TOTAL PCDFs	217.47	5.51E-02	1.49E-01	1.16E-01	2.60E-12	2.06E-11	
TOTAL PCDDs and PCDFs	542.67	1.38E-01	3.71E-01	2.91E-01	6.48E-12	5.15E-11	

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1A
 Run Number: S-1A-M428-2
 Run Date: 04/05/18
 Parameter Catch Weight

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	3.75	1.01E-03	2.85E-03	2.15E-03	4.47E-14	3.55E-13	
Other TCDD	62.15	1.68E-02	4.72E-02	3.57E-02	7.41E-13	5.88E-12	
1,2,3,7,8-PeCDD	12.7	3.42E-03	9.64E-03	7.29E-03	1.51E-13	1.20E-12	
Other PeCDD	54.2	1.46E-02	4.12E-02	3.11E-02	6.47E-13	5.13E-12	
1,2,3,4,7,8-HxCDD	6.59	1.78E-03	5.00E-03	3.78E-03	7.86E-14	6.24E-13	
1,2,3,6,7,8-HxCDD	10	2.70E-03	7.59E-03	5.74E-03	1.19E-13	9.47E-13	
1,2,3,7,8,9-HxCDD	8.63	2.33E-03	6.55E-03	4.95E-03	1.03E-13	8.17E-13	
Other HxCDD	72.88	1.96E-02	5.53E-02	4.18E-02	8.69E-13	6.90E-12	
1,2,3,4,6,7,8-HpCDD	38.2	1.03E-02	2.90E-02	2.19E-02	4.56E-13	3.62E-12	
Other HpCDD	33.3	8.98E-03	2.53E-02	1.91E-02	3.97E-13	3.15E-12	
OCDD	75.4	2.03E-02	5.73E-02	4.33E-02	8.99E-13	7.14E-12	
TOTAL PCDDs	377.80	1.02E-01	2.87E-01	2.17E-01	4.51E-12	3.58E-11	
PCDFs							
2,3,7,8-TCDF	62.4	1.68E-02	4.74E-02	3.58E-02	7.44E-13	5.91E-12	
Other TCDF	1387.6	3.74E-01	1.05E+00	7.96E-01	1.66E-11	1.31E-10	
1,2,3,7,8-PeCDF	69.2	1.87E-02	5.25E-02	3.97E-02	8.25E-13	6.55E-12	
2,3,4,7,8-PeCDF	24.4	6.58E-03	1.85E-02	1.40E-02	2.91E-13	2.31E-12	
Other PeCDF	480.4	1.30E-01	3.65E-01	2.76E-01	5.73E-12	4.55E-11	
1,2,3,4,7,8-HxCDF	46.1	1.24E-02	3.50E-02	2.65E-02	5.50E-13	4.36E-12	
1,2,3,6,7,8-HxCDF	52.5	1.42E-02	3.99E-02	3.01E-02	6.26E-13	4.97E-12	
2,3,4,6,7,8-HxCDF	39.5	1.06E-02	3.00E-02	2.27E-02	4.71E-13	3.74E-12	
1,2,3,7,8,9-HxCDF	7.49	2.02E-03	5.69E-03	4.30E-03	8.93E-14	7.09E-13	
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,6,7,8-HpCDF	80.7	2.18E-02	6.13E-02	4.63E-02	9.63E-13	7.64E-12	
1,2,3,4,7,8,9-HpCDF	17.3	4.66E-03	1.31E-02	9.93E-03	2.06E-13	1.64E-12	
Other HpCDF	29	7.82E-03	2.20E-02	1.66E-02	3.46E-13	2.75E-12	
OCDF	34.8	9.38E-03	2.64E-02	2.00E-02	4.15E-13	3.29E-12	
TOTAL PCDFs	2331.39	6.28E-01	1.77E+00	1.34E+00	2.78E-11	2.21E-10	
TOTAL PCDDs and PCDFs	2709.19	7.30E-01	2.06E+00	1.55E+00	3.23E-11	2.56E-10	

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1A
 Run Number: S-1A-M428-3
 Run Date: 04/06/18
 Parameter Catch Weight

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	1.71	4.66E-04	1.32E-03	9.75E-04	2.04E-14	1.62E-13	
Other TCDD	7.43	2.02E-03	5.72E-03	4.24E-03	8.87E-14	7.04E-13	
1,2,3,7,8-PeCDD	2.86	7.79E-04	2.20E-03	1.63E-03	3.41E-14	2.71E-13	
Other PeCDD	6.01	1.64E-03	4.62E-03	3.43E-03	7.18E-14	5.69E-13	
1,2,3,4,7,8-HxCDD	3.25	8.86E-04	2.50E-03	1.85E-03	3.88E-14	3.08E-13	
1,2,3,6,7,8-HxCDD	3.12	8.50E-04	2.40E-03	1.78E-03	3.72E-14	2.96E-13	
1,2,3,7,8,9-HxCDD	3.18	8.67E-04	2.45E-03	1.81E-03	3.80E-14	3.01E-13	
Other HxCDD	8.05	2.19E-03	6.19E-03	4.59E-03	9.61E-14	7.63E-13	
1,2,3,4,6,7,8-HpCDD	13.4	3.65E-03	1.03E-02	7.64E-03	1.60E-13	1.27E-12	
Other HpCDD	11.4	3.11E-03	8.77E-03	6.50E-03	1.36E-13	1.08E-12	
OCDD	27.2	7.41E-03	2.09E-02	1.55E-02	3.25E-13	2.58E-12	
TOTAL PCDDs	87.61	2.39E-02	6.74E-02	5.00E-02	1.05E-12	8.30E-12	
PCDFs							
2,3,7,8-TCDF	6.95	1.89E-03	5.35E-03	3.96E-03	8.30E-14	6.59E-13	
Other TCDF	67.25	1.83E-02	5.17E-02	3.84E-02	8.03E-13	6.37E-12	
1,2,3,7,8-PeCDF	2.59	7.06E-04	1.99E-03	1.48E-03	3.09E-14	2.45E-13	
2,3,4,7,8-PeCDF	2.74	7.47E-04	2.11E-03	1.56E-03	3.27E-14	2.60E-13	
Other PeCDF	31.97	8.71E-03	2.46E-02	1.82E-02	3.82E-13	3.03E-12	
1,2,3,4,7,8-HxCDF	1.6	4.36E-04	1.23E-03	9.13E-04	1.91E-14	1.52E-13	
1,2,3,6,7,8-HxCDF	2.44	6.65E-04	1.88E-03	1.39E-03	2.91E-14	2.31E-13	
2,3,4,6,7,8-HxCDF	1.27	3.46E-04	9.77E-04	7.24E-04	1.52E-14	1.20E-13	
1,2,3,7,8,9-HxCDF	1.44	3.92E-04	1.11E-03	8.21E-04	1.72E-14	1.36E-13	
Other HxCDF	2.2	5.99E-04	1.69E-03	1.25E-03	2.63E-14	2.08E-13	
1,2,3,4,6,7,8-HpCDF	3.3	8.99E-04	2.54E-03	1.88E-03	3.94E-14	3.13E-13	
1,2,3,4,7,8,9-HpCDF	1.73	4.71E-04	1.33E-03	9.87E-04	2.07E-14	1.64E-13	
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
OCDF	2.64	7.19E-04	2.03E-03	1.51E-03	3.15E-14	2.50E-13	
TOTAL PCDFs	128.12	3.49E-02	9.86E-02	7.31E-02	1.53E-12	1.21E-11	
TOTAL PCDDs and PCDFs	215.73	5.88E-02	1.66E-01	1.23E-01	2.58E-12	2.04E-11	
3-Run Average		3.09E-01	8.65E-01	6.56E-01	1.38E-11	1.09E-10	

EXAMPLE CALCULATIONS, RUN S-1A-M428-1

ABSOLUTE PRESSURE, INCHES OF MERCURY

$$\begin{aligned} P_s &= P_{bar} + P_g/13.6 \\ &= 29.90 + -0.02/13.6 \\ &= 29.9 \end{aligned}$$

VOLUME OF WATER VAPOR, STANDARD CUBIC FEET

$$\begin{aligned} V_{wstd} &= 0.002667 * [(T_{std} + 460) / P_{std}] * V_{lc} \\ &= 0.002667 * [(0 + 460) / 29.92 * 189.8] \\ &= 8.934 \end{aligned}$$

SAMPLED VOLUME OF SOURCE GAS, DRY STANDARD CUBIC FEET

$$\begin{aligned} V_{mstd} &= [(T_{std} + 460)/P_{std}] * Y * V_m * (P_{bar} + \Delta H/13.6) / (460 + t_m) \\ &= [(0 + 460)/29.92] * 1.0000 * 139.528 * (29.90 + 0.903/13.6) / (460 + 70) \\ &= 139.293 \end{aligned}$$

MOISTURE CONTENT, PERCENT BY VOLUME

$$\begin{aligned} \%H_2O &= V_{wstd} / (V_{wstd} + V_{mstd}) \\ &= 8.934 / (8.934 + 139.293) \\ &= 6.0 \end{aligned}$$

DRY MOLE FRACTION, LB-MOLE/LB-MOLE

$$\begin{aligned} M_{fd} &= 1 - \%H_2O/100 \\ &= 1 - 6.03/100 \\ &= 0.940 \end{aligned}$$

DRY MOLECULAR WEIGHT, LB/LB-MOLE

$$\begin{aligned} M_d &= 44 * (\%CO_2/100) + 32 * (\%O_2/100) + 28 * [(100 - (\%CO_2 + \%O_2))/100] \\ &= 44 * (4.5/100) + 32 * (14.3/100) + 28 * [(100 - (4.5 + 14.3))/100] \\ &= 29.28 \end{aligned}$$

WET MOLECULAR WEIGHT, LB/LB-MOLE

$$\begin{aligned} M_s &= M_d * M_{fd} + 18.0 * \%H_2O/100 \\ &= 29.28 * 0.940 + 18.0 * 6.03/100 \\ &= 28.60 \end{aligned}$$

FUEL FACTOR

$$\begin{aligned} F_o &= (20.9 - \%O_2) / \%CO_2 \\ &= (20.9 - 14.3) / 4.5 \\ &= 1.479 \end{aligned}$$

ISOKINETIC SAMPLING RATE, PERCENT

$$\begin{aligned} \%I &= P_{std}/(T_{std} + 460) * (100/60) * V_{mstd} * (t_s + 460) / [P_s * v_s * M_{fd} * \Theta * (\pi * Dia^2 * Dia/576)] \\ &= 29.92/(0 + 460) * (100/60) * 139.293 * (989 + 460) / [29.90 * 9.14 * 0.940 * 240.00 * (\pi * 0.751^2 * 0.751/576)] \\ &= 100.6 \end{aligned}$$

VELOCITY, FEET PER SECOND

$$\begin{aligned} v_s &= 85.49 * C_p * \text{SQRT}[\Delta p * (460 + t_s) / P_s / M_s] \\ &= 85.49 * 0.84 * \text{SQRT}[0.0096 * (460 + 989) / 29.90 / 28.60] \\ &= 9.14 \end{aligned}$$

VOLUMETRIC FLOW RATE, ACTUAL CUBIC FEET PER MINUTE

$$\begin{aligned} Q_{aw} &= (60/144) * v_s * A \\ &= (60/144) * 9.14 * 77 \\ &= 292 \end{aligned}$$

VOLUMETRIC FLOW RATE, DRY STANDARD CUBIC FEET PER MINUTE

$$\begin{aligned} Q_{sd} &= (60/144) * M_{fd} * v_s * A * (T_{std} + 460) / (t_s + 460) * (P_s / P_{std}) \\ &= (60/144) * 0.940 * 9.14 * 77 * (0 + 460) / (989 + 460) * (29.90/29.92) \\ &= 100 \end{aligned}$$

TOTAL PCDDs CONCENTRATION, NANOGRAMS PER DRY STANDARD CUBIC METER

$$\begin{aligned} \text{ng/DSCM} &= (\text{Catch/Conversion}) * 1,000,000,000 / (V_{mstd} * 0.02832) \\ &= (325/1000000000000) * 1,000,000,000 / (139.293 * 0.02832) \\ &= 0.082 \end{aligned}$$

EXAMPLE CALCULATIONS, RUN S-1A-M428-1

TOTAL PCDDS CONCENTRATION, NANOGRAMS PER DRY STANDARD CUBIC METER @ 12% CO2

$$\text{ng/DSCM}@12\%\text{CO}_2 = \text{ng/DSCM} * 12 / \% \text{CO}_2$$

$$= 0.082 * 12 / 4.5$$

$$= 0.222$$

TOTAL PCDDS CONCENTRATION, NANOGRAMS PER DRY STANDARD CUBIC METER @ 7% O2

$$\text{ng/DSCM}@7\%\text{O}_2 = \text{ng/DSCM} * (20.9-7) / (20.9-\% \text{O}_2)$$

$$= 0.082 * (20.9-7) / (20.9-14.32)$$

$$= 0.174$$

TOTAL PCDDS EMISSION RATE, GRAMS PER SECOND

$$\text{gms/sec} = (\text{Catch/Conversion}) * \text{Qsd} / 60 / \text{Vmstd}$$

$$= (325/1000000000000) * 100 / 60 / 139.293$$

$$= 0.00000000000389$$

TOTAL PCDDS EMISSION RATE, POUNDS PER HOUR

$$\text{lb/hr} = 60 * (\text{Catch/Conversion}) * \text{Qsd} / 453.592 / \text{Vmstd}$$

$$= 60 * (0/1000000000000) * 100 / 453.592 / 139.293$$

$$= 0.00000000000308$$

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

Client Name	AECOM	Operator		MN CO
Plant Name	COCA-COLA	Project #		14875
Sampling Location	STACK SVE1B	Standard Temperature, °F		68

USE IN AVERAGE OF RUN SET? 1 or 0 =>		1	1	1	SET AVERAGE
Run Number		S-1B-M428-1	S-1B-M428-2	S-1B-M428-3	
Run Date		04/11/18	04/12/18	04/13/18	
Run Start Time	hh:mm	751	730	730	
Run Stop Time	hh:mm	1002	1134	1136	
Meter Calibration Factor	Y	1.0000	1.0000	1.0000	
Pitot Tube Coefficient	C _p	0.84	0.84	0.84	
Actual Nozzle Diameter	in	0.751	0.751	0.751	
Sample Volume	ft ³	186.105	213.121	213.545	204.26
Total Sampling Time	min	240	240	240	240.00
Average Meter Temperature	°F	77.6	67.8	73.6	73.00
Average Stack Temperature	°F	1235.7	1335.4	1348.8	1306.64
Barometric Pressure	in Hg	29.9	29.9	29.9	29.90
Stack/Duct Static Pressure	in H ₂ O	-0.25	-0.23	-0.27	-0.25
Absolute Stack/Duct Pressure	in Hg	29.9	29.9	29.9	29.88
Average Delta H	in H ₂ O	2.15	2.71	2.69	2.52
Absolute Meter Pressure	in Hg	30.1	30.1	30.1	30.09
Avg Differential Pressure (Delta P)	in H ₂ O	0.020	0.028	0.028	0.03
Total Water Volume Collected	mL	270.8	302.5	291.2	288.17
Volume of Water vapor @ STP	SCF	12.747	14.239	13.707	13.56
Volume Metered @ STP	DSCF	183.558	214.398	212.462	203.47
Calculated Stack Moisture	% H ₂ O	6.5	6.2	6.1	6.26
Saturated Stack Moisture	% H ₂ O	100.0	100.0	100.0	100.00
Reported Stack Moisture Content	% H ₂ O	6.5	6.2	6.1	6.26
Carbon Dioxide Percentage	% CO ₂	11.25	11.3	11.0	11.18
Oxygen Percentage	% O ₂	9.3	9.6	9.4	9.45
Carbon Monoxide Percentage	% CO	0.0	0.0	0.0	0.00
Nitrogen Percentage	% N ₂	79.4	79.1	79.6	79.37
Dry Mole Fraction	decimal	0.935	0.938	0.939	0.94
Dry Gas Molecular Weight	lb/lb-mole	30.17	30.19	30.14	30.17
Wet Stack Gas Molecular Weight	lb/lb-mole	29.38	29.43	29.40	29.40
Flue Gas Density	lb/ft ³	0.0763	0.0764	0.0763	0.08
Calculated Fuel Factor	F _o	1.03	1.00	1.04	1.02
F-Factor	DSCF/MM	9595	9595	9595	9595.00
Heat Input Rate	MMBtu/hr	0	1	1	0.49
Percent Excess Air	% EA	80.0	84.8	81.5	82.11
Stack Cross-Sectional Area	in ²	76.6	76.6	76.6	76.60
Stack Cross-Sectional Area	ft ²	0.53	0.53	0.53	0.53
Percent of Isokinetic Rate	% ISO	102.3	101.9	101.7	101.93
Air Flow Rate Results					0.00
Average Stack Gas Velocity	ft/sec	13.94	17.26	17.23	16.14
Dry Standard Stack Flow/Minute	DSCFM	129	152	151	143.91
Wet Standard Stack Flow/Minute	WSCFM	138	162	160	153.50

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

ANALYTICAL DATA			S-1B-M428-1		S-1B-M428-2		S-1B-M428-3		Conversion
	Compound	Unit	Pre	Amt	Pre	Amt	Pre	Amt	Factor
1	2,3,7,8-TCDD	pg	<	1.70	<	1.04	<	1.28	1E+12
2	Total TCDD	pg	<	1.70	<	1.53	<	1.28	1E+12
3	1,2,3,7,8-PeCDD	pg	<	2.76	<	1.70	<	2.36	1E+12
4	Total PeCDD	pg	<	2.76	<	1.70	<	2.36	1E+12
5	1,2,3,4,7,8-HxCDD	pg	<	2.64	<	2.18	<	2.89	1E+12
6	1,2,3,6,7,8-HxCDD	pg	<	2.43	<	2.09	<	2.77	1E+12
7	1,2,3,7,8,9-HxCDD	pg	<	2.40	<	2.13	<	2.62	1E+12
8	Total HxCDD	pg	<	21.6		4.81	<	2.83	1E+12
9	1,2,3,4,6,7,8-HpCDD	pg		13.1		7.51	<	3.00	1E+12
10	Total HpCDD	pg		27.9		14.3	<	7.64	1E+12
11	OCDD	pg	<	23.8	<	15.4		14.5	1E+12
12	2,3,7,8-TCDF	pg		3.90	<	2.29	<	1.65	1E+12
13	Total TCDF	pg		29.9	<	7.26		12.7	1E+12
14	1,2,3,7,8-PeCDF	pg	<	2.72	<	2.29	<	1.91	1E+12
15	2,3,4,7,8-PeCDF	pg		3.23	<	2.39	<	1.98	1E+12
16	Total PeCDF	pg		2.48		4.29	<	2.92	1E+12
17	1,2,3,4,7,8-HxCDF	pg		7.43	<	1.21		2.30	1E+12
18	1,2,3,6,7,8-HxCDF	pg		5.41	<	1.09	<	1.12	1E+12
19	2,3,4,6,7,8-HxCDF	pg	<	1.64	<	1.21	<	1.24	1E+12
20	1,2,3,7,8,9-HxCDF	pg	<	1.85	<	1.37	<	1.40	1E+12
21	Total HxCDF	pg		12.8	<	2.26		6.51	1E+12
22	1,2,3,4,6,7,8-HpCDF	pg		25.2		6.63	<	4.55	1E+12
23	1,2,3,4,7,8,9-HpCDF	pg	<	1.80	<	1.61	<	1.79	1E+12
24	Total HpCDF	pg		25.2		6.63	<	4.55	1E+12
25	OCDF	pg		11.6	<	2.81	<	2.85	1E+12

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1B
 Run Number: S-1B-M428-1
 Run Date: 04/11/18
 Parameter Catch Weight

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	1.7	3.27E-04	3.49E-04	3.93E-04	2.00E-14	1.59E-13	
Other TCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,7,8-PeCDD	2.76	5.31E-04	5.66E-04	6.37E-04	3.24E-14	2.57E-13	
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,7,8-HxCDD	2.54	4.89E-04	5.21E-04	5.87E-04	2.98E-14	2.37E-13	
1,2,3,6,7,8-HxCDD	2.43	4.67E-04	4.99E-04	5.61E-04	2.85E-14	2.27E-13	
1,2,3,7,8,9-HxCDD	2.48	4.77E-04	5.09E-04	5.73E-04	2.91E-14	2.31E-13	
Other HxCDD	14.15	2.72E-03	2.90E-03	3.27E-03	1.66E-13	1.32E-12	
1,2,3,4,6,7,8-HpCDD	13.1	2.52E-03	2.69E-03	3.02E-03	1.54E-13	1.22E-12	
Other HpCDD	14.8	2.85E-03	3.04E-03	3.42E-03	1.74E-13	1.38E-12	
OCDD	23.8	4.58E-03	4.88E-03	5.50E-03	2.80E-13	2.22E-12	
TOTAL PCDDs	77.76	1.50E-02	1.60E-02	1.80E-02	9.14E-13	7.25E-12	
PCDFs							
2,3,7,8-TCDF	3.9	7.50E-04	8.00E-04	9.01E-04	4.58E-14	3.64E-13	
Other TCDF	26	5.00E-03	5.34E-03	6.00E-03	3.05E-13	2.42E-12	
1,2,3,7,8-PeCDF	2.72	5.23E-04	5.58E-04	6.28E-04	3.20E-14	2.54E-13	
2,3,4,7,8-PeCDF	3.23	6.21E-04	6.63E-04	7.46E-04	3.79E-14	3.01E-13	
Other PeCDF	17.85	3.43E-03	3.66E-03	4.12E-03	2.10E-13	1.66E-12	
1,2,3,4,7,8-HxCDF	7.43	1.43E-03	1.52E-03	1.72E-03	8.73E-14	6.93E-13	
1,2,3,6,7,8-HxCDF	5.41	1.04E-03	1.11E-03	1.25E-03	6.36E-14	5.04E-13	
2,3,4,6,7,8-HxCDF	1.64	3.15E-04	3.37E-04	3.79E-04	1.93E-14	1.53E-13	
1,2,3,7,8,9-HxCDF	1.85	3.56E-04	3.80E-04	4.27E-04	2.17E-14	1.73E-13	
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,6,7,8-HpCDF	25.2	4.85E-03	5.17E-03	5.82E-03	2.96E-13	2.35E-12	
1,2,3,4,7,8,9-HpCDF	1.8	3.46E-04	3.69E-04	4.16E-04	2.11E-14	1.68E-13	
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
OCDF	11.6	2.23E-03	2.38E-03	2.68E-03	1.36E-13	1.08E-12	
TOTAL PCDFs	108.63	2.09E-02	2.23E-02	2.51E-02	1.28E-12	1.01E-11	
TOTAL PCDDs and PCDFs	186.39	3.59E-02	3.82E-02	4.30E-02	2.19E-12	1.74E-11	

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1B
 Run Number: S-1B-M428-2
 Run Date: 04/12/18

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	1.04	1.71E-04	1.82E-04	2.11E-04	1.23E-14	9.74E-14	
Other TCDD	0.49	8.07E-05	8.59E-05	9.92E-05	5.78E-15	4.59E-14	
1,2,3,7,8-PeCDD	1.7	2.80E-04	2.98E-04	3.44E-04	2.01E-14	1.59E-13	
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,7,8-HxCDD	2.18	3.59E-04	3.82E-04	4.41E-04	2.57E-14	2.04E-13	
1,2,3,6,7,8-HxCDD	2.09	3.44E-04	3.67E-04	4.23E-04	2.47E-14	1.96E-13	
1,2,3,7,8,9-HxCDD	2.13	3.51E-04	3.74E-04	4.31E-04	2.51E-14	1.99E-13	
Other HxCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,6,7,8-HpCDD	7.51	1.24E-03	1.32E-03	1.52E-03	8.86E-14	7.03E-13	
Other HpCDD	7.29	1.20E-03	1.28E-03	1.48E-03	8.60E-14	6.82E-13	
OCDD	15.4	2.54E-03	2.70E-03	3.12E-03	1.82E-13	1.44E-12	
TOTAL PCDDs	39.83	6.56E-03	6.98E-03	8.06E-03	4.70E-13	3.73E-12	
PCDFs							
2,3,7,8-TCDF	2.29	3.77E-04	4.02E-04	4.64E-04	2.70E-14	2.14E-13	
Other TCDF	4.97	8.19E-04	8.72E-04	1.01E-03	5.86E-14	4.65E-13	
1,2,3,7,8-PeCDF	2.29	3.77E-04	4.02E-04	4.64E-04	2.70E-14	2.14E-13	
2,3,4,7,8-PeCDF	2.39	3.94E-04	4.19E-04	4.84E-04	2.82E-14	2.24E-13	
Other PeCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,7,8-HxCDF	1.21	1.99E-04	2.12E-04	2.45E-04	1.43E-14	1.13E-13	
1,2,3,6,7,8-HxCDF	1.09	1.80E-04	1.91E-04	2.21E-04	1.29E-14	1.02E-13	
2,3,4,6,7,8-HxCDF	1.21	1.99E-04	2.12E-04	2.45E-04	1.43E-14	1.13E-13	
1,2,3,7,8,9-HxCDF	1.37	2.26E-04	2.40E-04	2.77E-04	1.62E-14	1.28E-13	
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,6,7,8-HpCDF	6.63	1.09E-03	1.16E-03	1.34E-03	7.82E-14	6.21E-13	
1,2,3,4,7,8,9-HpCDF	1.61	2.65E-04	2.82E-04	3.26E-04	1.90E-14	1.51E-13	
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
OCDF	2.81	4.63E-04	4.93E-04	5.69E-04	3.31E-14	2.63E-13	
TOTAL PCDFs	27.87	4.59E-03	4.89E-03	5.64E-03	3.29E-13	2.61E-12	
TOTAL PCDDs and PCDFs	67.70	1.30E-02	1.39E-02	1.60E-02	7.99E-13	6.34E-12	

Plant Name: COCA-COLA
 Sampling Location: STACK SVE1B
 Run Number: S-1B-M428-3
 Run Date: 04/13/18

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	
PCDDs							
2,3,7,8-TCDD	1.28	2.13E-04	2.32E-04	2.58E-04	1.51E-14	1.20E-13	
Other TCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,7,8-PeCDD	2.36	3.92E-04	4.27E-04	4.75E-04	2.79E-14	2.21E-13	
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,7,8-HxCDD	2.89	4.80E-04	5.23E-04	5.82E-04	3.41E-14	2.71E-13	
1,2,3,6,7,8-HxCDD	2.77	4.60E-04	5.01E-04	5.58E-04	3.27E-14	2.60E-13	
1,2,3,7,8,9-HxCDD	2.82	4.69E-04	5.10E-04	5.68E-04	3.33E-14	2.64E-13	
Other HxCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,6,7,8-HpCDD	3	4.99E-04	5.43E-04	6.04E-04	3.54E-14	2.81E-13	
Other HpCDD	4.64	7.71E-04	8.40E-04	9.35E-04	5.48E-14	4.35E-13	
OCDD	14.5	2.41E-03	2.62E-03	2.92E-03	1.71E-13	1.36E-12	
TOTAL PCDDs	34.26	5.69E-03	6.20E-03	6.90E-03	4.05E-13	3.21E-12	
PCDFs							
2,3,7,8-TCDF	1.65	2.74E-04	2.99E-04	3.32E-04	1.95E-14	1.55E-13	
Other TCDF	11.05	1.84E-03	2.00E-03	2.23E-03	1.31E-13	1.04E-12	
1,2,3,7,8-PeCDF	1.91	3.17E-04	3.46E-04	3.85E-04	2.26E-14	1.79E-13	
2,3,4,7,8-PeCDF	1.98	3.29E-04	3.58E-04	3.99E-04	2.34E-14	1.86E-13	
Other PeCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,3,4,7,8-HxCDF	2.3	3.82E-04	4.16E-04	4.63E-04	2.72E-14	2.16E-13	
1,2,3,6,7,8-HxCDF	1.12	1.86E-04	2.03E-04	2.26E-04	1.32E-14	1.05E-13	
2,3,4,6,7,8-HxCDF	1.24	2.06E-04	2.24E-04	2.50E-04	1.46E-14	1.16E-13	
1,2,3,7,8,9-HxCDF	1.4	2.33E-04	2.53E-04	2.82E-04	1.65E-14	1.31E-13	
Other HxCDF	0.45	7.48E-05	8.14E-05	9.06E-05	5.32E-15	4.22E-14	
1,2,3,4,6,7,8-HpCDF	4.55	7.56E-04	8.23E-04	9.16E-04	5.38E-14	4.27E-13	
1,2,3,4,7,8,9-HpCDF	1.79	2.97E-04	3.24E-04	3.61E-04	2.11E-14	1.68E-13	
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
OCDF	2.85	4.74E-04	5.16E-04	5.74E-04	3.37E-14	2.67E-13	
TOTAL PCDFs	32.29	5.37E-03	5.84E-03	6.50E-03	3.81E-13	3.03E-12	
TOTAL PCDDs and PCDFs	66.55	1.28E-02	1.39E-02	1.55E-02	7.86E-13	6.24E-12	
3-Run Average		2.06E-02	2.20E-02	2.49E-02	1.26E-12	9.99E-12	

APPENDIX A
DIOXINS/FURANS (PTO STACK)

2.0 Field Data

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SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION EPA METHOD 1A

CLIENT: AECOM / Cal Klean
 PLANT NAME: Coca-Cola Distribution Center
 CITY, STATE: Torrance, CA
 SAMPLING LOCATION TO Exhaust
 TYPE OF TESTING: Particulate

NO. OF PORTS AVAILABLE: 2
 NO. OF PORTS TO BE USED: 2
 PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 12.00 inches
 NIPPLE LENGTH AND/OR WALL THICKNESS: 2.125 inches
 DEPTH OF STACK OR DUCT, D: 9.88 inches
 STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER

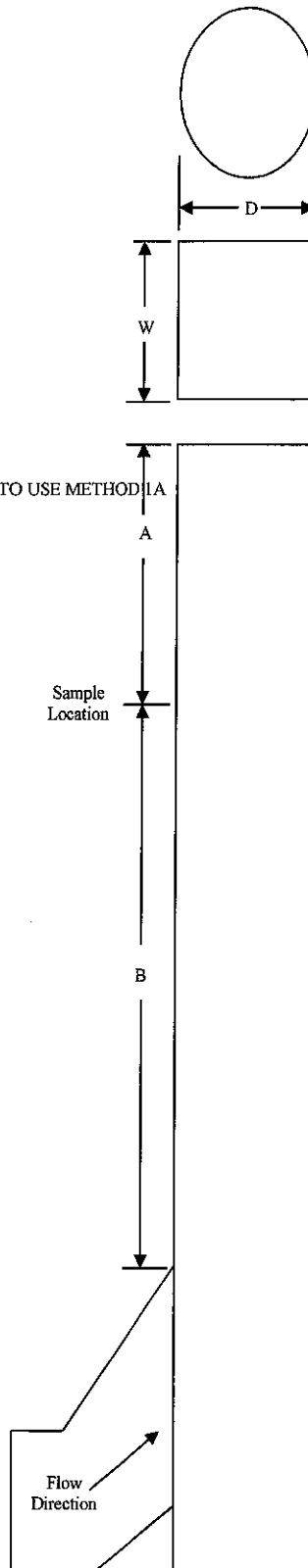
$$D_e = 2 * (\text{DEPTH}) * (\text{WIDTH}) / (\text{DEPTH} + \text{WIDTH}) = 9.88 \text{ inches}$$

STACK/DUCT AREA = 0.53 sq. feet 76.6 sq. inches

DISTANCE OF TEST PORT LOCATION:	DOWNSTREAM	UPSTREAM
	FROM FLOW	FROM FLOW
	<u>DISTURBANCE</u>	<u>DISTURBANCE</u>
	B	A
# OF INCHES	24.00	12.00
# OF DIAMETERS	2.43	1.22

MINIMUM NUMBER OF TRAVERSE POINTS: 24



POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	2 5/8
2	6.7	0.66	2 3/4
3	11.8	1.17	3 1/4
4	17.7	1.75	3 7/8
5	25.0	2.47	4 5/8
6	35.6	3.52	5 5/8
7	64.4	6.36	8 1/2
8	75.0	7.41	9 1/2
9	82.3	8.13	10 1/4
10	88.2	8.71	10 7/8
11	93.3	9.21	11 3/8
12	97.9	9.38	11 1/2



DRAWING NOT TO SCALE

CARB

428

Client Name	AECOM	Run #	S-1A-M428-1		
Plant Name	COCA-COLA	Project #	14875	Run Start	802
Plant City, State	TORRANCE, CA	Personnel	MN RV	Run End	1210
Test Location	STACK SVE1A	Tester Signature			
Date of Test	4/4/18	Checked By	 DM		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tare		Actuals
ΔH @ 0.75 SCFM	1.85	Pbar	29.9	Meter Console #	M32.5	NA	NA	CO ₂
Meter Calibration Factor	1.00	Pstatic	0.0231	Ideal Nozzle Diameter	0.835			4.45
Pitot Tube Coefficient	0.84	Abs P	29.9	Nozzle #	30P-1			O ₂
Estimated Dry Gas Meter Temp	70	Tstd, °F	68	Actual Nozzle Diameter	0.751			14.32
Estimated Stack Temp or M2 Avg.	1350	Pstd	29.92	Probe Lgth/ID #	3	30P-1		CO
Estimated Delta P or M2 Avg.	0.0132	Estimates		Liner Material	GL	XAD ID & Tare		0.0
Estimated Moisture Content	6.0	CO ₂	4.5	Filter Box #	NA	NA-1	326.2	N ₂
Estimated Dry Molecular Weight	29.30	O ₂	14.5	Cold Box ID #	NA			81.2
Estimated Velocity, ft/sec	12.0	CO	0.0	Umbilical ID #	NA			H ₂ O
K Factor (delta H/delta P)	98.62	N ₂	81.0	TC ID #s	30P-1			189.8

Equipment & Leak Check Data, OK? Y or N					Leak Checks	1	2	3	4	5	6	Status
Tambient	NA	NA	PRE	POST	DGM initial		520.420				520.420	0.000
Thermocouples			Y	Y	Vacuum	15	12	10			MAN	15.0
Pitots			Y	Y	Leak Rate	0.002	0.002	0.000			4/10/10	OK
Tedlar Bag					DGM final		520.50				520.500	0.000

[illegible]

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD CARB

428

Client Name	AECOM	Run #	S-1A-M428-2		
Plant Name	COCA-COLA	Project #	14875	Run Start	8:35
Plant City, State	TORRANCE, CA	Personnel	MAI RV	Run End	1241
Test Location	STACK SVE1A	Tester Signature			
Date of Test	4/5/10	Checked By			

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tare		Actuals
ΔH @ 0.75 SCFM	1.85	Pbar	29.9	Meter Console #	MB25	NA	NA	CO ₂
Meter Calibration Factor	1.00	Pstatic	-0.0242	Ideal Nozzle Diameter	0.791			4.26
Pitot Tube Coefficient	0.99	Abs P	29.9	Nozzle #	32P.2			O ₂
Estimated Dry Gas Meter Temp	70	Tstd, °F	68	Actual Nozzle Diameter	0.792	46 5.16.18		14.37
Estimated Stack Temp or M2 Avg.	1000	Pstd	29.92	Probe Lgth/ID #	3	3A P.2		CO
Estimated Delta P or M2 Avg.	0.0138	Estimates		Liner Material	GL	XAD ID & Tare		0.00
Estimated Moisture Content	6.0	CO ₂	4.5	Filter Box #	NA	XAD-2	236.0	N ₂
Estimated Dry Molecular Weight	29.30	O ₂	14.5	Cold Box ID #	NA			81.4
Estimated Velocity, ft/sec	10.8	CO	0.0	Umbilical ID #	NA			H ₂ O
K Factor (delta H/delta P)	116.06	N ₂	81.0	TC ID #s	3A P.2			



Equipment & Leak Check Data, OK? Y or N					Leak Checks		1	2	3	4	5	6	Status
Tambient	NA	NA	PRE	POST	DGM initial			656.75				656.750	0.000
Thermocouples		Y	Y		Vacuum		15	12	10				0.15
Pitots		Y	Y		Leak Rate		0.004	0.002	0.000				OK
Tedlar Bag					DGM final			656.95				656.950	0.000

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Probe Temp	248±9 Filter Temp	Imp. Exit Temp	Cond Temp.
	24 hr	min	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	in Hg	°F	°F	°F	°F	°F	°F	
A - 12	835	0.0	591.624	0.0079	0.92	0.92	4	60	60	1093	NA	252	49	36
- 11		10.0	596.62	0.0079	1.04	1.05	5	63	63	1092	NA	255	45	39
- 10		20.0	602.15	0.0075	0.87	0.87	5	65	65	1093	NA	253	45	40
- 9		30.0	607.08	0.0091	1.06	1.05	5	65	65	1095	NA	251	46	39
- 8		40.0	612.450	0.0095	1.10	1.10	5	66	66	1094	NA	251	47	36
- 7		50.0	617.97	0.0093	1.08	1.10	5	67	67	1094	NA	253	46	39
- 6		60.0	623.48	0.0113	1.31	1.30	5	68	68	1093	NA	251	47	40
- 5		70.0	629.59	0.0085	0.99	0.99	5	69	69	1095	NA	252	47	40
- 4		80.0	634.89	0.0089	1.03	1.05	5	69	69	1093	NA	252	48	40
- 3		90.0	640.38	0.0076	0.88	0.88	4	69	69	1094	NA	251	47	40
- 2		100.0	645.42	0.0090	1.14	1.15	5	70	70	1097	NA	257	48	40
- 1		110.0	651.09	0.0096	1.14	1.10	5	70	70	1094	NA	251	49	40
B - 12		120.0	656.75	0.0096	1.11	1.10	5	71	71	1093	NA	254	48	40
- 11		130.0	662.390	0.0098	1.14	1.15	5	72	72	1095	NA	251	45	40
- 10		140.0	668.140	0.0086	1.00	1.00	5	72	72	1094	NA	252	45	40
- 9		150.0	673.770	0.0094	1.09	1.10	5	73	73	1096	NA	250	47	41
- 8		160.0	678.910	0.0079	0.92	0.92	5	73	73	1097	NA	250	47	41
- 7		170.0	684.08	0.0114	1.32	1.3	5	74	74	1098	NA	252	46	41
- 6		180.0	690.26	0.0095	1.10	1.1	5	74	74	1096	NA	253	47	42
- 5		190.0	695.86	0.0083	0.96	0.96	5	74	74	1095	NA	252	47	42
- 4		200.0	701.250	0.0084	0.97	0.97	5	74	74	1095	NA	252	47	42
- 3		210.0	706.55	0.0075	0.87	0.87	5	74	74	1094	NA	251	47	43
- 2		220.0	711.850	0.0089	1.03	1.00	5	75	75	1096	NA	250	46	42
- 1		230.0	716.49	0.012	1.30	1.30	5	75	75	1097	NA	257	46	42
END	1241	240.0	723.125								NA			
MAX => 5														
Average Values		240.0	0.000	0.009	1.06	1.06		70	1095					

131.301

CARB

428

Client Name	AECOM	Run #	S-1A-M428- 3		
Plant Name	COCA-COLA	Project #	14875	Run Start	725
Plant City, State	TORRANCE, CA	Personnel	MN RV	Run End	1129
Test Location	STACK SVE1A	Tester Signature			
Date of Test	4/6/18	Checked By			

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tare		Actuals
ΔH @ 0.75 SCFM	1.85	Pbar	29.9	Meter Console #	MB25	NA	NA	CO ₂
Meter Calibration Factor	1.06	Pstatic	29.9235	Ideal Nozzle Diameter	0.804			4.25
Pitot Tube Coefficient	0.84	Abs P	29.9	Nozzle #	3QP-1			O ₂
Estimated Dry Gas Meter Temp	70	Tstd, °F	68	Actual Nozzle Diameter	0.751			14.26
Estimated Stack Temp or M2 Avg.	1140	Pstd	29.92	Probe Lgth/ID #	3 3	3 QP-1		CO
Estimated Delta P or M2 Avg.	0.0152	Estimates		Liner Material	GL	XAD ID & Tare		0.00
Estimated Moisture Content	6.0	CO ₂	4.5	Filter Box #	NA	XAD-3	330.3	N ₂
Estimated Dry Molecular Weight	29.30	O ₂	14.5	Cold Box ID #	NA			81.5
Estimated Velocity, ft/sec	11.1	CO	0.0	Umbilical ID #	NA			H ₂ O
K Factor (delta H/delta P)	108.64	N ₂	81.0	TC ID #s	3QP-1			

Equipment & Leak Check Data, OK? Y or N					Leak Checks	1	2	3	4	5	6	Status
Tambient	NA	NA	PRE	POST	DGM initial		790.770				790.77	-0.000
Thermocouples			Y	Y	Vacuum	15	10	10			15.0	15.0
Pitots			Y	Y	Leak Rate	0.003	0.007	0.000			0.000	OK
Tedlar Bag					DGM final		790.856				790.850	-0.000

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Probe Temp	24hr Filter Temp	Imp. Exit Temp
	24 hr	min	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	in Hg	°F	°F	°F	°F	°F	°F
A - 12	725	0.0	726.312	0.0093	1.00	1.00	3	56	56	1099	NA	252	538
- 11		10.0	731.65	0.0087	0.94	0.94	4	58	58	1101	NA	252	538
- 10		20.0	736.89	0.0113	1.22	1.20	5	60	60	1104	NA	251	546
- 9		30.0	742.84	0.0098	1.03	1.05	5	63	63	1098	NA	252	538
- 8		40.0	748.77	0.0079	0.85	0.85	5	64	64	1103	NA	252	538
- 7		50.0	753.29	0.0086	0.93	0.93	5	66	66	1102	NA	251	538
- 6		60.0	758.48	0.0071	0.77	0.77	4	67	67	1104	NA	254	538
- 5		70.0	763.76	0.0098	1.06	1.05	5	68	68	1101	NA	255	538
- 4		80.0	768.88	0.0069	0.75	0.75	4	70	70	1105	NA	252	538
- 3		90.0	773.68	0.0104	1.17	1.10	5	71	71	1098	NA	252	538
- 2		100.0	779.58	0.0108	1.17	1.15	5	73	73	1102	NA	254	538
- 1		110.0	785.51	0.0089	0.90	0.90	4	74	74	1101	NA	253	538
B - 12	929	120.0	790.770	0.0084	0.91	0.91	4	75	75	1102	NA	252	538
- 11		130.0	796.07	0.0097	0.99	0.99	5	76	76	1094	NA	255	538
- 10		140.0	801.63	0.0102	1.10	1.10	5	77	77	1095	NA	253	538
- 9		150.0	807.57	0.0094	1.02	1.02	5	78	78	1099	NA	253	538
- 8		160.0	813.17	0.0079	0.85	0.85	5	78	79	1102	NA	252	538
- 7		170.0	818.34	0.0071	0.78	0.78	4	80	80	1103	NA	251	538
- 6		180.0	823.28	0.0086	0.93	0.93	5	81	81	1106	NA	252	539
- 5		190.0	828.74	0.0078	0.84	0.84	5	82	82	1101	NA	250	539
- 4		200.0	833.97	0.0091	0.98	0.98	5	83	83	1104	NA	253	539
- 3		210.0	839.39	0.0114	1.23	1.25	5	84	84	1099	NA	251	539
- 2		220.0	845.73	0.0099	1.07	1.05	5	84	84	1102	NA	252	539
- 1		230.0	851.58	0.0085	0.92	0.92	5	86	86	1094	NA	252	539
- END	1179	240.0	857.060								NA		
-													
-													
-													
-													
-													
-													
				MAX =>				5					
Average Values		240.0	0.000	0.009	1.93	0.97		23		1101			

130662

428

[illegible]AKI No.: 14875 Page 32 of 131

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD CARB

428

Client Name	AECOM	Run #	S-1B-M428-2
Plant Name	COCA-COLA	Project #	14875
Plant City, State	TORRANCE, CA	Personnel	TL
Test Location	STACK SVE1B	Tester Signature	TL
Date of Test	4-12-18	Checked By	TL

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tare		Actuals
ΔH @ 0.75 SCFM	1.85	Pbar	29.9	Meter Console #	MB25	NA	NA	CO ₂
Meter Calibration Factor	1.00	Pstatic	-0.23	Ideal Nozzle Diameter	1.687			11.72
Pitot Tube Coefficient	0.84	Abs P	29.9	Nozzle #	3QP-1			O ₂
Estimated Dry Gas Meter Temp	70	Tstd, °F	68	Actual Nozzle Diameter	0.751			9.59
Estimated Stack Temp or M2 Avg.	130.0	Pstd	29.92	Probe Lgth/ID #	3QP-1			CO
Estimated Delta P or M2 Avg.	0.0280	Estimates		Liner Material	QTZ	XAD ID & Tare		0.0
Estimated Moisture Content	6.0	CO ₂	4.5	Filter Box #	NA	XAD-5	3260	N ₂
Estimated Dry Molecular Weight	29.80	O ₂	14.5	Cold Box ID #	NA			79.1
Estimated Velocity, ft/sec	17.2	CO	0.0	Umbilical ID #	NA			H ₂ O
K Factor (delta H/delta P)	95.72	N ₂	81.0	TC ID #s	3QP-1			

Equipment & Leak Check Data, OK? Y or N				Leak Checks		1	2	3	4	5	6	Status
Tambient	NA	NA	PRE	POST	DGM initial							0.000
Thermocouples			Y	Y	Vacuum	15	15					0
Pitots			Y	Y	Leak Rate	0.004	0.007					OK
Tedlar Bag	NA				DGM final							0.000

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	248±9 Probe Temp	248±9 Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	in Hg	°F	°F	°F	°F	°F	°F	°F
A - 12	730	0.0	44.3790	0.0232	2.27	2.25	5	58	58	1317	NA	249	48	39
- 11		10.0	52.530	0.0269	2.57	2.55	8	59	59	1330		250	48	42
- 10		20.0	61.00	0.0265	2.54	2.55	9	60	60	1346		255	47	42
- 9		30.0	69.400	0.0317	3.03	3.00	10	62	62	1348		253	47	41
- 8		40.0	79.400	0.0329	3.15	3.15	11	62	62	1360		255	46	42
- 7		50.0	88.48	0.0319	3.05	3.05	11	62	62	1367		255	47	42
- 6		60.0	97.45	0.0286	2.74	2.75	11	67	67	1290		247	50	39
- 5		70.0	107.44	0.0317	3.03	3.00	11	67	67	1360		255	51	39
- 4		80.0	116.990	0.0200	1.91	1.90	10	68	68	1367		255	51	38
- 3		90.0	124.34	0.0314	3.01	3.00	11	69	69	1325		252	49	38
- 2		100.0	133.800	0.0297	2.84	2.85	11	69	69	1280		247	49	38
- 1		110.0	143.100	0.0272	2.60	2.60	11	70	70	1265		248	49	38
B - 12	934	120.0	152.154	0.0218	2.09	2.10	8	69	69	1289		252	53	39
- 11		130.0	160.23	0.0242	2.32	2.30	8	69	69	1245		247	53	39
- 10		140.0	168.52	0.0259	2.48	2.50	10	70	70	1280		248	54	39
- 9		150.0	176.85	0.0295	2.82	2.80	10	70	70	1324		247	55	40
- 8		160.0	185.800	0.0326	3.12	3.10	11	71	71	1330		248	56	40
- 7		170.0	194.800	0.0274	2.62	2.60	11	71	71	1320		247	57	41
- 6		180.0	203.45	0.0318	3.04	3.05	11	72	72	1380		249	58	42
- 5	213.00	190.0	212.80	0.0279	2.67	2.65	11	72	72	1356		247	55	43
- 4		200.0	221.400	0.0232	2.22	2.20	11	72	72	1380		245	55	43
- 3		210.0	230.00	0.0293	2.80	2.80	11	72	72	1360		247	55	43
- 2		220.0	238.83	0.0328	3.14	3.15	11	73	73	1384		248	55	45
- 1		230.0	247.95	0.0336	3.22	3.20	11	73	73	1390		250	57	45
END	1134	240.0	257.500											

Average Values	240.0		0.028	2.72	2.71		68	1335
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ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD CARB

428

Client Name	AECOM	Run #	S-1B-M428-3		
Plant Name	COCA-COLA	Project #	14875	Run Start	730
Plant City, State	TORRANCE, CA	Personnel	MN 60	Run End	1136
Test Location	STACK SVE1B	Tester Signature	<i>[Signature]</i>		
Date of Test	4/13/18	Checked By	<i>[Signature]</i>		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tare		Actuals
ΔH @ 0.75 SCFM	1.85	Pbar	79.9	Meter Console #	M825	NA	NA	CO ₂
Meter Calibration Factor	1.00	Pstatic	-0.268	Ideal Nozzle Diameter	0.682			11.02
Pitot Tube Coefficient	0.84	Abs P	79.9	Nozzle #	32P1			O ₂
Estimated Dry Gas Meter Temp	70	Tstd, °F	68	Actual Nozzle Diameter	0.751			9.43
Estimated Stack Temp or M2 Avg.	130.0	Pstd	29.92	Probe Lgth/ID #	3	32P1		CO
Estimated Delta P or M2 Avg.	0.078	Estimates		Liner Material	QTZ	XAD ID & Tare		0.07
Estimated Moisture Content	6.0	CO ₂	4.5	Filter Box #	NA	XAD-6	322.4	N ₂
Estimated Dry Molecular Weight	29.30	O ₂	14.5	Cold Box ID #	NA			79.6
Estimated Velocity, ft/sec	17.7	CO	0.0	Umbilical ID #	NA			H ₂ O
K Factor (delta H/delta P)	95.71	N ₂	81.0	TC ID #s	32P-1			

Equipment & Leak Check Data, OK? Y or N				Leak Checks		1	2	3	4	5	6	Status
Tambient	NA	NA	PRE	POST	DGM initial		363840					0.000
Thermocouples			Y	Y	Vacuum	15	15	15				15.0
Pitots			Y	Y	Leak Rate	0.003	0.002	0.004				OK
Tedlar Bag					DGM final		363860					0.000

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	248±9 Probe Temp	248±9 Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	in Hg	°F	°F	°F	°F	°F	°F	°F
A - 12	730	0.0	258.290	0.0223	2.13	2.15	7	55	55	1365	NA	254	49	35
- 11		10.0	265.840	0.0249	2.38	2.40	9	57	57	1369	NA	252	47	36
- 10		20.0	274.02	0.0314	3.01	3.00	11	60	60	1362	NA	250	47	36
- 9		30.0	283.19	0.0289	2.77	2.78	10	62	62	1340	NA	251	49	37
- 8		40.0	292.15	0.0246	2.34	2.35	9	65	65	1334	NA	251	51	38
- 7		50.0	302.48	0.0199	2.27	2.25	10	68	68	1328	NA	255	53	38
- 6		60.0	309.62	0.0278	2.64	2.65	11	69	69	1343	NA	255	53	38
- 5		70.0	318.49	0.0317	2.03	2.05	11	70	70	1362	NA	251	55	38
- 4		80.0	327.84	0.0372	2.13	2.15	12	71	71	1335	NA	250	56	39
- 3		90.0	337.24	0.0278	2.66	2.65	11	72	72	1352	NA	252	57	39
- 2		100.0	346.090	0.0269	2.57	2.55	11	73	73	1344	NA	249	50	40
- 1		110.0	354.85	0.0274	2.67	2.60	11	73	73	1348	NA	252	51	39
B - 12	736	120.0	363.84	0.0268	2.32	2.35	10	75	75	1352	NA	253	52	39
- 11		130.0	372.45	0.0283	2.71	2.70	10	76	76	1349	NA	250	52	40
- 10		140.0	381.290	0.0319	3.05	3.05	11	78	78	1352	NA	248	54	40
- 9		150.0	390.795	0.0377	3.08	3.10	11	78	78	1346	NA	250	57	39
- 8		160.0	400.250	0.0239	2.29	2.30	11	80	80	1351	NA	248	57	39
- 7		170.0	408.650	0.0244	2.81	2.80	11	82	82	1340	NA	249	56	40
- 6		180.0	417.750	0.0275	2.63	2.65	11	82	82	1248	NA	249	56	40
- 5		190.0	426.530	0.0281	2.69	2.70	11	84	84	1255	NA	248	57	40
- 4		200.0	435.760	0.0315	3.11	3.10	12	84	84	1346	NA	250	58	40
- 3		210.0	445.325	0.0331	3.17	3.15	12	84	84	1350	NA	248	58	40
- 2		220.0	455.14	0.0241	2.31	2.30	11	84	84	1349	NA	251	59	40
- 1		230.0	463.72	0.0228	2.18	2.20	11	85	85	1347	NA	253	60	41
END	736	240.0	471.955											

Average Values	240.0	0.028	2.69	2.69	74	1349
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MOISTURE AND FIELD RECOVERY SHEET (METHOD - CARB 428)

Assembled by: V. Macedoni

Box No.: KB20 Date Prepared: 3/27/18

Job No. 14875
Plant Name AECOM
City/State Torrance, CA
Test Location TO Stack

Run Number	<u>5-1B-M428</u>	<u>5-1B-M428-5</u>	<u>5-1B-M428-6</u>
Test Date	<u>4.11.18</u>	<u>4.12.18</u>	<u>4.13.18</u>
Analysis Date	<u>4.11.18</u>	<u>4.12.18</u>	<u>4.13.18</u>
Analyst	<u>NC</u>	<u>NC</u>	<u>NC</u>

Reagent HPLC DI H₂O
Volume (ml) 100

Final Wt., g	<u>748.5</u>	<u>772.2</u>	<u>734.4</u>
Tared Wt., g	<u>534.2</u>	<u>529.4</u>	<u>501.5</u>
Catch, g	<u>214.3</u>	<u>242.8</u>	<u>232.9</u>

Reagent XAD Resin
Volume (ml) _____

Final Wt., g	<u>335.7</u>	<u>334.5</u>	<u>330.4</u>
Tared Wt., g	<u>327.0</u>	<u>326.0</u>	<u>322.4</u>
Catch, g	<u>8.7</u>	<u>8.5</u>	<u>8.0</u>

Reagent _____
Volume (ml) _____

Final Wt., g			
multiply by 1.1*			
Empty Wt., g			
Catch, g			

*(KMnO₄ density of 1.1 g/ml)

Silica Gel

Final Wt., g	<u>447.8</u>	<u>451.2</u>	<u>450.3</u>
Tared Wt., g	<u>400</u>	<u>400</u>	<u>400</u>
Catch, g	<u>47.8</u>	<u>51.2</u>	<u>50.3</u>

TOTAL, g 270.8 302.5 503 4.13.18

291.2

Balance No. DT 8
Span Weight, g 1000
Reading, g (± 0.5) 1000.2

% Silica Gel Spent 80
Liquid Level Marked (?) ✓

Filter (if applicable)

No./Tare, g NA
No./Tare, g NA

Light Brown Light Brown Light Brown

Filter Appearance (if applicable)

Clear Clear Clear

Reagent Appearance (if needed)

Comments

Reviewer DM

Intentionally Left Blank

APPENDIX A
DIOXINS/FURANS (PTO STACK)

3.0 Analytical Data

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May 07, 2018

Vista Work Order No. 1800551

Mr. Neal Conroy
AirKinetics, Inc.
1308 S. Allec Street
Anaheim, CA 92805

Dear Mr. Conroy,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on April 16, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'AECOM/14875'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink that reads "Martha Maier". The signature is fluid and cursive, with the first and last names clearly distinguishable.

Martha Maier
Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1800551

Case Narrative

Sample Condition on Receipt:

Eight MM5 samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The reagent blank components were placed on hold.

Analytical Notes:

CARB Method 428

These samples were extracted and analyzed for tetra-through-octa chlorinated dioxins and furans by CARB Method 428 using a ZB-5MS GC column.

Holding Times

The method holding time criteria were met for the samples.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery sample (OPR) were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

Case Narrative.....	1
Table of Contents.....	3
Sample Inventory.....	4
Analytical Results.....	6
Qualifiers.....	16
Certifications.....	17
Sample Receipt.....	18

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800551-01	S-1A-M428-1	04-Apr-18 12:10	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-02	S-1A-M428-2	05-Apr-18 12:41	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-03	S-1A-M428-3	06-Apr-18 11:29	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-04	M428-FB	06-Apr-18 12:00	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-05	S-1B-M428-1	11-Apr-18 12:02	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-06	S-1B-M428-2	12-Apr-18 11:34	16-Apr-18 15:55	XAD Filter FH Rinse IMP Contents IMP Rinse BH Rinse
1800551-07	S-1B-M428-3	13-Apr-18 11:36	16-Apr-18 15:55	XAD Filter FH Rinse

Vista Project: 1800551

Client Project: AECOM/14875

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800551-07	S-1B-M428-3	13-Apr-18 11:36	16-Apr-18 15:55	IMP Contents IMP Rinse BH Rinse
1800551-08	M428-RB	06-Apr-18 12:30	16-Apr-18 15:55	DI Water Methanol Rinse Toluene Rinse MeCl2 Rinse

ANALYTICAL RESULTS

Sample ID: Method Blank				CARB Method 428				
Matrix: Air		QC Batch: B8D0194 Date Extracted: 25-Apr-2018 7:07		Lab Sample: B8D0194-BLK1 Date Analyzed: 27-Apr-18 18:56 Column: ZB-5MS				
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.09			IS 13C-2,3,7,8-TCDD	97.0	40 - 130	
1,2,3,7,8-PeCDD	ND	1.94			IS 13C-1,2,3,7,8-PeCDD	84.7	40 - 130	
1,2,3,4,7,8-HxCDD	ND	2.82			IS 13C-1,2,3,6,7,8-HxCDD	90.2	40 - 130	
1,2,3,6,7,8-HxCDD	ND	2.70			IS 13C-1,2,3,4,6,7,8-HpCDD	87.5	25 - 130	
1,2,3,7,8,9-HxCDD	ND	2.75			IS 13C-OCDD	61.3	25 - 130	
1,2,3,4,6,7,8-HpCDD	ND	2.07			IS 13C-2,3,7,8-TCDF	92.5	40 - 130	
OCDD	ND	1.97			IS 13C-1,2,3,7,8-PeCDF	87.4	40 - 130	
2,3,7,8-TCDF	ND	1.29			IS 13C-1,2,3,6,7,8-HxCDF	96.5	40 - 130	
1,2,3,7,8-PeCDF	ND	2.07			IS 13C-1,2,3,4,6,7,8-HpCDF	98.6	25 - 130	
2,3,4,7,8-PeCDF	ND	2.15			IS 13C-OCDF	79.3	25 - 130	
1,2,3,4,7,8-HxCDF	ND	1.16			AS 13C-1,2,3,7,8,9-HxCDF	103	40 - 130	
1,2,3,6,7,8-HxCDF	ND	1.05			Toxic Equivalent Quotient (TEQ) Data			
1,2,3,7,8,9-HxCDF	ND	1.16			TEQMinWHO2005Dioxin			0.00
1,2,3,4,6,7,8-HpCDF	ND	1.36						
1,2,3,4,7,8,9-HpCDF	ND	1.58						
OCDF	ND	2.37						
Totals								
Total TCDD	ND	1.09						
Total PeCDD	ND	1.94						
Total HxCDD	ND	2.76						
Total HpCDD	ND	2.07						
Total TCDF	ND	1.29						
Total PeCDF	ND	2.11						
Total HxCDF	ND	1.16						
Total HpCDF	ND	1.46						

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: OPR

CARB Method 428

Matrix: Air		QC Batch: B8D0194 Date Extracted: 25-Apr-2018 7:07		Lab Sample: B8D0194-BS1 Date Analyzed: 27-Apr-18 16:31 Column: ZB-5MS			
Analyte	Amt Found (pg/Sample)	Spike Amt	%R	Limits	Labeled Standard	%R	LCL-UCL
2,3,7,8-TCDD	82.5	100	82.5	60 - 140	IS 13C-2,3,7,8-TCDD	102	40- 120
1,2,3,7,8-PeCDD	514	500	103	60 - 140	IS 13C-1,2,3,7,8-PeCDD	87.8	40- 120
1,2,3,4,7,8-HxCDD	498	500	99.5	60 - 140	IS 13C-1,2,3,6,7,8-HxCDD	88.0	40- 120
1,2,3,6,7,8-HxCDD	524	500	105	60 - 140	IS 13C-1,2,3,4,6,7,8-HpCDD	90.5	40- 120
1,2,3,7,8,9-HxCDD	502	500	100	60 - 140	IS 13C-OCDD	60.5	40- 120
1,2,3,4,6,7,8-HpCDD	421	500	84.1	60 - 140	IS 13C-2,3,7,8-TCDF	100	40- 120
OCDD	920	1000	92.0	60 - 140	IS 13C-1,2,3,7,8-PeCDF	89.6	40- 120
2,3,7,8-TCDF	74.5	100	74.5	60 - 140	IS 13C-1,2,3,6,7,8-HxCDF	91.4	40- 120
1,2,3,7,8-PeCDF	520	500	104	60 - 140	IS 13C-1,2,3,4,6,7,8-HpCDF	92.4	40- 120
2,3,4,7,8-PeCDF	505	500	101	60 - 140	IS 13C-OCDF	78.0	40- 120
1,2,3,4,7,8-HxCDF	465	500	93.1	60 - 140	AS 13C-1,2,3,7,8,9-HxCDF	97.8	40- 120
1,2,3,6,7,8-HxCDF	463	500	92.5	60 - 140			
1,2,3,4,6,7,8-HxCDF	451	500	90.2	60 - 140			
1,2,3,7,8,9-HxCDF	444	500	88.8	60 - 140			
1,2,3,4,6,7,8-HpCDF	391	500	78.2	60 - 140			
1,2,3,4,7,8,9-HpCDF	394	500	78.9	60 - 140			
OCDF	701	1000	70.1	60 - 140			

LCL-UCL - Lower control limit - upper control limit

Sample ID: S-1A-M428-1					CARB Method 428			
Client Data		Sample Data		Laboratory Data				
Name: AirKinetics, Inc.		Matrix: Air		Lab Sample: 1800551-01		Date Received: 16-Apr-2018 15:55		
Project: AECOM/14875				QC Batch: B8D0194		Date Extracted: 25-Apr-2018 7:07		
Date Collected: 04-Apr-2018 12:10				Date Analyzed: 04-May-18 12:26		Column: DB-225		
				27-Apr-18 19:44		Column: ZB-5MS		
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.69			IS 13C-2,3,7,8-TCDD	105	40 - 130	
1,2,3,7,8-PeCDD	ND	2.69			IS 13C-1,2,3,7,8-PeCDD	83.1	40 - 130	
1,2,3,4,7,8-HxCDD	4.71			J	IS 13C-1,2,3,6,7,8-HxCDD	88.4	40 - 130	
1,2,3,6,7,8-HxCDD	5.52			J	IS 13C-1,2,3,4,6,7,8-HpCDD	85.0	25 - 130	
1,2,3,7,8,9-HxCDD	ND		4.19		IS 13C-OCDD	60.4	25 - 130	
1,2,3,4,6,7,8-HpCDD	43.7			J	IS 13C-2,3,7,8-TCDF	104	40 - 130	
OCDD	126				IS 13C-1,2,3,7,8-PeCDF	93.3	40 - 130	
2,3,7,8-TCDF	8.42			J	IS 13C-1,2,3,6,7,8-HxCDF	98.4	40 - 130	
1,2,3,7,8-PeCDF	8.27			J	IS 13C-1,2,3,4,6,7,8-HpCDF	99.2	25 - 130	
2,3,4,7,8-PeCDF	4.73			J	IS 13C-OCDF	80.1	25 - 130	
1,2,3,4,7,8-HxCDF	ND		5.15		PS 37Cl-2,3,7,8-TCDD	98.0	70 - 130	
1,2,3,6,7,8-HxCDF	ND		5.76		PS 13C-2,3,4,7,8-PeCDF	93.1	70 - 130	
6,7,8-HxCDF	ND	1.49			PS 13C-1,2,3,4,7,8-HxCDD	114	70 - 130	
7,8,9-HxCDF	ND	1.69			PS 13C-1,2,3,4,7,8-HxCDF	102	70 - 130	
1,2,3,4,6,7,8-HpCDF	16.3			J	PS 13C-1,2,3,4,7,8,9-HpCDF	94.4	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.59			AS 13C-1,2,3,7,8,9-HxCDF	96.7	40 - 130	
OCDF	4.48			J				
Totals					Toxic Equivalent Quotient (TEQ) Data			
					TEQMinWHO2005Dioxin 4.17			
Total TCDD	10.1							
Total PeCDD	ND		16.8					
Total HxCDD	80.1		84.2					
Total HpCDD	92.2							
Total TCDF	97.8		132					
Total PeCDF	75.4							
Total HxCDF	21.9		38.0					
Total HpCDF	16.3							

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: S-1A-M428-2					CARB Method 428			
Client Data		Sample Data		Laboratory Data				
Name:	AirKinetics, Inc.	Matrix:	Air	Lab Sample:	1800551-02	Date Received:	16-Apr-2018 15:55	
Project:	AECOM/14875			QC Batch:	B8D0194	Date Extracted:	25-Apr-2018 7:07	
Date Collected:	05-Apr-2018 12:41			Date Analyzed:	04-May-18 14:02	Column:	DB-225	
					27-Apr-18 20:32	Column:	ZB-SMS	
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND		3.75		IS 13C-2,3,7,8-TCDD	120	40 - 130	
1,2,3,7,8-PeCDD	ND		12.7		IS 13C-1,2,3,7,8-PeCDD	97.9	40 - 130	
1,2,3,4,7,8-HxCDD	6.59			J	IS 13C-1,2,3,6,7,8-HxCDD	103	40 - 130	
1,2,3,6,7,8-HxCDD	10.0			J	IS 13C-1,2,3,4,6,7,8-HpCDD	97.5	25 - 130	
1,2,3,7,8,9-HxCDD	8.63			J	IS 13C-OCDD	65.8	25 - 130	
1,2,3,4,6,7,8-HpCDD	38.2			J	IS 13C-2,3,7,8-TCDF	115	40 - 130	
OCDD	75.4			J	IS 13C-1,2,3,7,8-PeCDF	105	40 - 130	
2,3,7,8-TCDF	62.4				IS 13C-1,2,3,6,7,8-HxCDF	108	40 - 130	
1,2,3,7,8-PeCDF	69.2				IS 13C-1,2,3,4,6,7,8-HpCDF	114	25 - 130	
2,3,4,7,8-PeCDF	24.4			J	IS 13C-OCDF	89.6	25 - 130	
1,2,3,4,7,8-HxCDF	46.1			J	PS 37Cl-2,3,7,8-TCDD	99.5	70 - 130	
1,2,3,6,7,8-HxCDF	52.5				PS 13C-2,3,4,7,8-PeCDF	101	70 - 130	
5,7,8-HxCDF	39.5			J	PS 13C-1,2,3,4,7,8-HxCDD	114	70 - 130	
7,8,9-HxCDF	7.49			J	PS 13C-1,2,3,4,7,8-HxCDF	110	70 - 130	
1,2,3,4,6,7,8-HpCDF	80.7				PS 13C-1,2,3,4,7,8,9-HpCDF	94.8	70 - 130	
1,2,3,4,7,8,9-HpCDF	17.3			J	AS 13C-1,2,3,7,8,9-HxCDF	101	40 - 130	
OCDF	34.8			J				
Totals					Toxic Equivalent Quotient (TEQ) Data			
Total TCDD	65.9		140		TEQ _{Min} WHO2005Dioxin	34.1		
Total PeCDD	66.9		101					
Total HxCDD	98.1							
Total HpCDD	71.5							
Total TCDF	1450							
Total PeCDF	574		689					
Total HxCDF	315		337					
Total HpCDF	127							

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: S-1A-M428-3					CARB Method 428				
Client Data			Sample Data		Laboratory Data				
Name: AirKinetics, Inc.			Matrix: Air		Lab Sample: 1800551-03		Date Received: 16-Apr-2018 15:55		
Project: AECOM/14875					QC Batch: B8D0194		Date Extracted: 25-Apr-2018 7:07		
Date Collected: 06-Apr-2018 11:29					Date Analyzed: 04-May-18 12:58 Column: DB-225				
					27-Apr-18 21:21 Column: ZB-5MS				
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard		%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.71			IS	13C-2,3,7,8-TCDD	105	40 - 130	
1,2,3,7,8-PeCDD	ND	2.86			IS	13C-1,2,3,7,8-PeCDD	85.2	40 - 130	
1,2,3,4,7,8-HxCDD	ND	3.25			IS	13C-1,2,3,6,7,8-HxCDD	88.3	40 - 130	
1,2,3,6,7,8-HxCDD	ND	3.12			IS	13C-1,2,3,4,6,7,8-HpCDD	82.4	25 - 130	
1,2,3,7,8,9-HxCDD	ND	3.18			IS	13C-OCDD	57.3	25 - 130	
1,2,3,4,6,7,8-HpCDD	13.4			J	IS	13C-2,3,7,8-TCDF	99.8	40 - 130	
OCDD	ND		27.2		IS	13C-1,2,3,7,8-PeCDF	89.3	40 - 130	
2,3,7,8-TCDF	6.95			J	IS	13C-1,2,3,6,7,8-HxCDF	90.5	40 - 130	
1,2,3,7,8-PeCDF	ND	2.59		J	IS	13C-1,2,3,4,6,7,8-HpCDF	104	25 - 130	
2,3,4,7,8-PeCDF	2.74				IS	13C-OCDF	77.1	25 - 130	
1,2,3,4,7,8-HxCDF	ND		1.60		PS	37Cl-2,3,7,8-TCDD	94.7	70 - 130	
1,2,3,6,7,8-HxCDF	ND		2.44		PS	13C-2,3,4,7,8-PeCDF	95.1	70 - 130	
6,7,8-HxCDF	ND	1.27			PS	13C-1,2,3,4,7,8-HxCDD	111	70 - 130	
7,8,9-HxCDF	ND	1.44			PS	13C-1,2,3,4,7,8-HxCDF	106	70 - 130	
1,2,3,4,6,7,8-HpCDF	ND		3.30		PS	13C-1,2,3,4,7,8,9-HpCDF	87.6	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.73			AS	13C-1,2,3,7,8,9-HxCDF	104	40 - 130	
OCDF	ND	2.64							
Totals					Toxic Equivalent Quotient (TEQ) Data				
					TEQMinWHO2005Dioxin 1.65				
Total TCDD	9.14		11.9						
Total PeCDD	ND		8.87						
Total HxCDD	17.6		20.8						
Total HpCDD	24.8								
Total TCDF	74.2		76.2						
Total PeCDF	37.3		41.2						
Total HxCDF	8.95		13.0						
Total HpCDF	ND		3.30						

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: M428-FB					CARB Method 428			
Client Data			Sample Data		Laboratory Data			
Name: AirKinetics, Inc.			Matrix: Air		Lab Sample: 1800551-04		Date Received: 16-Apr-2018 15:55	
Project: AECOM/14875					QC Batch: B8D0194		Date Extracted: 25-Apr-2018 7:07	
Date Collected: 06-Apr-2018 12:00					Date Analyzed: 27-Apr-18 22:09 Column: ZB-5MS			
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.38			IS 13C-2,3,7,8-TCDD	98.9	40 - 130	
1,2,3,7,8-PeCDD	ND	1.53			IS 13C-1,2,3,7,8-PeCDD	80.2	40 - 130	
1,2,3,4,7,8-HxCDD	ND	2.30			IS 13C-1,2,3,6,7,8-HxCDD	82.5	40 - 130	
1,2,3,6,7,8-HxCDD	ND	2.21			IS 13C-1,2,3,4,6,7,8-HpCDD	75.9	25 - 130	
1,2,3,7,8,9-HxCDD	ND	2.25			IS 13C-OCDD	55.1	25 - 130	
1,2,3,4,6,7,8-HpCDD	ND		2.08		IS 13C-2,3,7,8-TCDF	98.5	40 - 130	
OCDD	ND		6.44		IS 13C-1,2,3,7,8-PeCDF	88.6	40 - 130	
2,3,7,8-TCDF	ND	1.36			IS 13C-1,2,3,6,7,8-HxCDF	87.1	40 - 130	
1,2,3,7,8-PeCDF	ND	2.71			IS 13C-1,2,3,4,6,7,8-HpCDF	98.5	25 - 130	
2,3,4,7,8-PeCDF	ND	2.82			IS 13C-OCDF	72.3	25 - 130	
1,2,3,4,7,8-HxCDF	ND	1.34			PS 37Cl-2,3,7,8-TCDD	97.5	70 - 130	
1,2,3,6,7,8-HxCDF	ND	1.21			PS 13C-2,3,4,7,8-PeCDF	98.3	70 - 130	
6,7,8-HxCDF	ND	1.34			PS 13C-1,2,3,4,7,8-HxCDD	111	70 - 130	
7,8,9-HxCDF	ND	1.52			PS 13C-1,2,3,4,7,8-HxCDF	103	70 - 130	
1,2,3,4,6,7,8-HpCDF	ND	1.46			PS 13C-1,2,3,4,7,8,9-HpCDF	94.3	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.71			AS 13C-1,2,3,7,8,9-HxCDF	90.8	40 - 130	
OCDF	ND	2.74						
Totals					Toxic Equivalent Quotient (TEQ) Data			
Total TCDD	ND	1.38			TEQMinWHO2005Dioxin		0.00	
Total PeCDD	ND	1.53						
Total HxCDD	ND		2.81					
Total HpCDD	4.26		6.34					
Total TCDF	ND	1.36						
Total PeCDF	ND	2.76						
Total HxCDF	ND	1.34						
Total HpCDF	ND	1.58						

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: S-1B-M428-1						CARB Method 428		
Client Data			Sample Data		Laboratory Data			
Name: AirKinetics, Inc.			Matrix: Air		Lab Sample: 1800551-05		Date Received: 16-Apr-2018 15:55	
Project: AECOM/14875					QC Batch: B8D0194		Date Extracted: 25-Apr-2018 7:07	
Date Collected: 11-Apr-2018 12:02					Date Analyzed: 27-Apr-18 22:57 Column: ZB-5MS			
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.70			IS 13C-2,3,7,8-TCDD	98.5	40 - 130	
1,2,3,7,8-PeCDD	ND	2.76			IS 13C-1,2,3,7,8-PeCDD	81.4	40 - 130	
1,2,3,4,7,8-HxCDD	ND	2.54			IS 13C-1,2,3,6,7,8-HxCDD	85.1	40 - 130	
1,2,3,6,7,8-HxCDD	ND	2.43			IS 13C-1,2,3,4,6,7,8-HpCDD	80.6	25 - 130	
1,2,3,7,8,9-HxCDD	ND	2.48			IS 13C-OCDD	59.1	25 - 130	
1,2,3,4,6,7,8-HpCDD	13.1			J	IS 13C-2,3,7,8-TCDF	96.6	40 - 130	
OCDD	ND		23.8		IS 13C-1,2,3,7,8-PeCDF	85.8	40 - 130	
2,3,7,8-TCDF	3.90			J	IS 13C-1,2,3,6,7,8-HxCDF	89.2	40 - 130	
1,2,3,7,8-PeCDF	ND	2.72			IS 13C-1,2,3,4,6,7,8-HpCDF	103	25 - 130	
2,3,4,7,8-PeCDF	3.23			J	IS 13C-OCDF	78.6	25 - 130	
1,2,3,4,7,8-HxCDF	7.43			J	PS 37Cl-2,3,7,8-TCDD	99.5	70 - 130	
1,2,3,6,7,8-HxCDF	5.41			J	PS 13C-2,3,4,7,8-PeCDF	99.4	70 - 130	
5,7,8-HxCDF	ND	1.64			PS 13C-1,2,3,4,7,8-HxCDD	112	70 - 130	
7,8,9-HxCDF	ND	1.85			PS 13C-1,2,3,4,7,8-HxCDF	106	70 - 130	
1,2,3,4,6,7,8-HpCDF	25.2			J	PS 13C-1,2,3,4,7,8,9-HpCDF	90.2	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.80			AS 13C-1,2,3,7,8,9-HxCDF	102	40 - 130	
OCDF	11.6			J				
Totals					Toxic Equivalent Quotient (TEQ) Data			
					TEQMinWHO2005Dioxin 3.03			
Total TCDD	ND	1.70						
Total PeCDD	ND	2.76						
Total HxCDD	ND		21.6					
Total HpCDD	27.9							
Total TCDF	29.9		32.0					
Total PeCDF	23.8		26.3					
Total HxCDF	12.8		24.1					
Total HpCDF	25.2							

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: S-1B-M428-2					CARB Method 428			
Client Data		Sample Data		Laboratory Data				
Name:	AirKinetics, Inc.	Matrix:	Air	Lab Sample:	1800551-06	Date Received:	16-Apr-2018 15:55	
Project:	AECOM/14875			QC Batch:	B8D0194	Date Extracted:	25-Apr-2018 7:07	
Date Collected:	12-Apr-2018 11:34			Date Analyzed:	27-Apr-18 23:45	Column:	ZB-5MS	
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.04			IS 13C-2,3,7,8-TCDD	108	40 - 130	
1,2,3,7,8-PeCDD	ND	1.70			IS 13C-1,2,3,7,8-PeCDD	88.2	40 - 130	
1,2,3,4,7,8-HxCDD	ND	2.18			IS 13C-1,2,3,6,7,8-HxCDD	88.8	40 - 130	
1,2,3,6,7,8-HxCDD	ND	2.09			IS 13C-1,2,3,4,6,7,8-HpCDD	84.3	25 - 130	
1,2,3,7,8,9-HxCDD	ND	2.13			IS 13C-OCDD	60.8	25 - 130	
1,2,3,4,6,7,8-HpCDD	7.51			J	IS 13C-2,3,7,8-TCDF	104	40 - 130	
OCDD	ND		15.4		IS 13C-1,2,3,7,8-PeCDF	93.8	40 - 130	
2,3,7,8-TCDF	ND		2.29		IS 13C-1,2,3,6,7,8-HxCDF	93.7	40 - 130	
1,2,3,7,8-PeCDF	ND	2.29			IS 13C-1,2,3,4,6,7,8-HpCDF	107	25 - 130	
2,3,4,7,8-PeCDF	ND	2.39			IS 13C-OCDF	80.9	25 - 130	
1,2,3,4,7,8-HxCDF	ND	1.21			PS 37Cl-2,3,7,8-TCDD	95.4	70 - 130	
1,2,3,6,7,8-HxCDF	ND	1.09			PS 13C-2,3,4,7,8-PeCDF	97.0	70 - 130	
6,7,8-HxCDF	ND	1.21			PS 13C-1,2,3,4,7,8-HxCDD	113	70 - 130	
7,8,9-HxCDF	ND	1.37			PS 13C-1,2,3,4,7,8-HxCDF	108	70 - 130	
1,2,3,4,6,7,8-HpCDF	6.63			J	PS 13C-1,2,3,4,7,8,9-HpCDF	96.0	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.61			AS 13C-1,2,3,7,8,9-HxCDF	105	40 - 130	
OCDF	ND	2.81			Toxic Equivalent Quotient (TEQ) Data			
Totals					TEQ _{MinWHO2005Dioxin} 0.141			
Total TCDD	ND		1.53					
Total PeCDD	ND	1.70						
Total HxCDD	4.81		6.25					
Total HpCDD	14.8							
Total TCDF	ND		7.26					
Total PeCDF	4.49							
Total HxCDF	ND		2.26					
Total HpCDF	6.63							

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: S-1B-M428-3							CARB Method 428	
Client Data			Sample Data		Laboratory Data			
Name:	AirKinetics, Inc.		Matrix:	Air	Lab Sample:	1800551-07	Date Received:	16-Apr-2018 15:55
Project:	AECOM/14875				QC Batch:	B8D0194	Date Extracted:	25-Apr-2018 7:07
Date Collected:	13-Apr-2018 11:36				Date Analyzed:	28-Apr-18 00:33	Column:	ZB-5MS
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.28			IS 13C-2,3,7,8-TCDD	101	40 - 130	
1,2,3,7,8-PeCDD	ND	2.36			IS 13C-1,2,3,7,8-PeCDD	84.7	40 - 130	
1,2,3,4,7,8-HxCDD	ND	2.89			IS 13C-1,2,3,6,7,8-HxCDD	90.4	40 - 130	
1,2,3,6,7,8-HxCDD	ND	2.77			IS 13C-1,2,3,4,6,7,8-HpCDD	84.4	25 - 130	
1,2,3,7,8,9-HxCDD	ND	2.82			IS 13C-OCDD	61.1	25 - 130	
1,2,3,4,6,7,8-HpCDD	ND		3.00		IS 13C-2,3,7,8-TCDF	106	40 - 130	
OCDD	14.5			J	IS 13C-1,2,3,7,8-PeCDF	91.8	40 - 130	
2,3,7,8-TCDF	ND	1.65			IS 13C-1,2,3,6,7,8-HxCDF	97.4	40 - 130	
1,2,3,7,8-PeCDF	ND	1.91			IS 13C-1,2,3,4,6,7,8-HpCDF	109	25 - 130	
2,3,4,7,8-PeCDF	ND	1.98			IS 13C-OCDF	82.1	25 - 130	
1,2,3,4,7,8-HxCDF	2.30			J	PS 37Cl-2,3,7,8-TCDD	97.9	70 - 130	
1,2,3,6,7,8-HxCDF	ND	1.12			PS 13C-2,3,4,7,8-PeCDF	95.9	70 - 130	
6,7,8-HxCDF	ND	1.24			PS 13C-1,2,3,4,7,8-HxCDD	110	70 - 130	
7,8,9-HxCDF	ND	1.40			PS 13C-1,2,3,4,7,8-HxCDF	101	70 - 130	
1,2,3,4,6,7,8-HpCDF	ND		4.55		PS 13C-1,2,3,4,7,8,9-HpCDF	89.6	70 - 130	
1,2,3,4,7,8,9-HpCDF	ND	1.79			AS 13C-1,2,3,7,8,9-HxCDF	98.4	40 - 130	
OCDF	ND	2.85			Toxic Equivalent Quotient (TEQ) Data			
Totals						TEQMinWHO2005Dioxin	0.234	
Total TCDD	ND	1.28						
Total PeCDD	ND	2.36						
Total HxCDD	ND	2.83						
Total HpCDD	ND		7.64					
Total TCDF	12.7							
Total PeCDF	ND		2.82					
Total HxCDF	6.51							
Total HpCDF	ND		4.55					

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank.
D	Dilution
E	The associated compound concentration exceeded the calibration range of the instrument.
H	Recovery and/or RPD was outside laboratory acceptance limits.
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ.
M	Estimated Maximum Possible Concentration. (CA Region 2 projects only)
*	See Cover Letter
Conc.	Concentration
NA	Not applicable
ND	Not Detected
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

1800551 7.9°C, 18.3°C, 16.9°C

PO Number: 8419-NC

Sample Chain of Custody Record

Page 1 of 3


Project Name: AECOM		AKI PM: Neal Conroy		Analyses Required										Comments	
Location: Torrance, CA		PM Phone: (714) 254-1945; Ext. 210		Dioxins / Furans (CARB 428)											
Project No.: 14875		PM email: conroyn@airkineticsinc.com													
<input type="checkbox"/> Full Data Package With Report				Results to: akisublab@airkineticsinc.com											
Date	End Time	Sample ID	Component	Matrix											
4/4/2018	1210	S - 1A - M428 - 1	XAD Resin		✓										
			Filter		✓										
			FH Rinse	MeOH, Tol, MeCl	✓										
			Imp Contents	H2O	✓										
			Imp Rinse	MeOH, Tol, MeCl	✓										
			BH Rinse	MeOH, Tol, MeCl	✓										
4/5/2018	1241	S - 1A - M428 - 2	XAD Resin		✓										
			Filter		✓										
			FH Rinse	MeOH, Tol, MeCl	✓										
			Imp Contents	H2O	✓										
			Imp Rinse	MeOH, Tol, MeCl	✓										
			BH Rinse	MeOH, Tol, MeCl	✓										
TAT: Std - 3 Weeks			Relinquished by: (Sign & Print)		Date/Time	Locked Storage		Received by: (Sign & Print)		Date/Time					
Ship to: Martha Maier Vista Analytical 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520			Catherine Orsagueda		4/16/18 3:53pm	<input type="checkbox"/>		Sydney Roughton		1601					
			[Signature]			<input type="checkbox"/>		[Signature]		4/16/18					
AirKinetics, Inc. 1308 South Allec Street Anaheim, CA 92805 (714) 254-1945															



Work Order 1800551

Page 18 of 25

1800551

PO Number: 8419-NC		Sample Chain of Custody Record				Page 2 of 3												
Project Name: AECOM		AKI PM: Neal Conroy		Analyses Required														
Location: Torrance, CA		PM Phone: (714) 254-1945; Ext. 210																
Project No.: 14875		PM email: conroyn@airkineticsinc.com																
<input type="checkbox"/> Full Data Package With Report		Results to: akisublab@airkineticsinc.com																
Date	End Time	Sample ID	Component	Matrix	Dioxins / Furans (CARB 428)													Comments
4/6/2018	1129	S - 1A - M428 - 3	XAD Resin		✓													
			Filter		✓													
			FH Rinse	MeOH, Tol, MeCl	✓													
			Imp Contents	H2O	✓													
			Imp Rinse	MeOH, Tol, MeCl	✓													
			BH Rinse	MeOH, Tol, MeCl	✓													
4/6/2018	1200	M428-FB	XAD Resin		✓													
			Filter		✓													
			FH Rinse	MeOH, Tol, MeCl	✓													
			Imp Contents	H2O	✓													
			Imp Rinse	MeOH, Tol, MeCl	✓													
			BH Rinse	MeOH, Tol, MeCl	✓													
TAT: Std - 3 Weeks		Relinquished by: (Sign & Print)		Date/Time	Locked Storage	Received by: (Sign & Print)		Date/Time										
Ship to: Martha Maier Vista Analytical 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520		<i>Catherine C. Oguz</i>		4/16/18	<input type="checkbox"/>	<i>Sydney Roughton</i>		1601										
		<i>Conroy</i>		15:53	<input type="checkbox"/>	<i>Sydney Roughton</i>		4/16/18										
					<input type="checkbox"/>													
					<input type="checkbox"/>													
 AirKinetics, Inc. 1308 South Allec Street Anaheim, CA 92805 (714) 254-1945					<input type="checkbox"/>													
					<input type="checkbox"/>													

1800551

PO Number: 8419-NC

Sample Chain of Custody Record

Page 1 of 2

Project Name: AECOM		AKI PM: Neal Conroy		Analyses Required										Comments	
Location: Torrance, CA		PM Phone: (714) 254-1945; Ext. 210		Dioxins / Furans (CARB 428)											
Project No.: 14875		PM email: conroyn@airkineticsinc.com													
<input type="checkbox"/> Full Data Package With Report		Results to: akisublab@airkineticsinc.com													
Date	End Time	Sample ID	Component	Matrix											
4/11/2018	1202	S - 1B - M428 - 1	XAD Resin		✓										
			Filter		✓										
			FH Rinse	MeOH, Tol, MeCl	✓										
			Imp Contents	H2O	✓										
			Imp Rinse	MeOH, Tol, MeCl	✓										
			BH Rinse	MeOH, Tol, MeCl	✓										
4/12/2018	1134	S - 1B - M428 - 2	XAD Resin		✓										
			Filter		✓										
			FH Rinse	MeOH, Tol, MeCl	✓										
			Imp Contents	H2O	✓										
			Imp Rinse	MeOH, Tol, MeCl	✓										
			BH Rinse	MeOH, Tol, MeCl	✓										
TAT: Std - 3 Weeks		Relinquished by: (Sign & Print)		Date/Time	Locked Storage	Received by: (Sign & Print)		Date/Time							
Ship to: Martha Maier Vista Analytical 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520		Morgan Nigam		15:30	<input type="checkbox"/>	Sydney Roughton		1557							
		[Signature]		4/13/18	<input type="checkbox"/>	[Signature]		4/16/18							
AirKinetics, Inc. 1308 South Allec Street Anaheim, CA 92805 (714) 254-1945															

Work Order 1800551

Page 20 of 25

PO Number: 8419-NC

Sample Chain of Custody Record

Page 2 of 2

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Work Order 1800551

Page 21 of 25

PO Number: 8419-NC

Sample Chain of Custody Record

Page 3 of 3

[illegible]

Work Order 1800551

Page 22 of 25

Sample Log-in Checklist

Vista Work Order #: 1800551 TAT Std

Samples Arrival:	Date/Time 4/16/18 1555	Initials: SR	Location: WR-2
Logged In:	Date/Time 04/17/18 0958	Initials: JRB WMS	Location: R1
Delivered By:	FedEx	UPS	On Trac
	GSO	DHL	<u>Hand Delivered</u>
Preservation:	Ice	<u>Blue Ice</u>	Dry Ice
			None
Temp °C: 7.9 (uncorrected)	Time: 1620		Thermometer ID: HR-4 ^{SR} 4/16/18 DT-3
Temp °C: 7.9 (corrected)	Probe used: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

blue cooler

	YES	NO	NA
Adequate Sample Volume Received?	<input checked="" type="checkbox"/>		
Holding Time Acceptable?	<input checked="" type="checkbox"/>		
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>		
Shipping Custody Seals Intact?			<input checked="" type="checkbox"/>
Shipping Documentation Present?			<input checked="" type="checkbox"/>
Airbill			<input checked="" type="checkbox"/>
Trk #			<input checked="" type="checkbox"/>
Sample Container Intact?	<input checked="" type="checkbox"/>		
Sample Custody Seals Intact?			<input checked="" type="checkbox"/>
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>		
COC Anomaly/Sample Acceptance Form completed?		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			<input checked="" type="checkbox"/>
Preservation Documented:	Na ₂ S ₂ O ₃	Trizma	None
	Yes	No	<u>NA</u>
Shipping Container	<u>Vista</u>	<u>Client</u>	Retain
	<u>Return</u>		Dispose

Comments: Received 7 unused filters and petri dishes SR 4/16/18

PUF Cartridge

8-MT09-2
-3
-4
-5
-6
-7

XAD

S-1A-M428-2
-1
-3
S-1B-M428-1
-2
-3
ID.: LR - SLC

Filters

S-1A-M428-1
-2
-3
S-1B-M428-1
-2
-3
Rev No.: 0

Rev Date: 05/18/2017

Page: 1 of 1

Sample Log-in Checklist

 Vista Work Order #: 1800551 TAT Std

Samples Arrival:	Date/Time 4/16/18 1555	Initials: SR-AL	Location: WK-2 Shelf/Rack: N/A
Logged In:	Date/Time 4/17/18 0958	Initials: JAB WWS	Location: WK R-1 4/17/18 WWS Shelf/Rack: N/A
Delivered By:	FedEx	UPS	On Trac
	GSO	DHL	<u>Hand Delivered</u>
Preservation:	Ice	Blue Ice	Dry Ice
			<u>None</u>
Temp °C: 18.4 (uncorrected)	Time: 1610		Thermometer ID: IR-4
Temp °C: 18.3 (corrected)	Probe used: Yes <input type="checkbox"/> No <input type="checkbox"/>		

FB20 on lid

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?			✓
Airbill			✓
Trk #			
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓
Preservation Documented:	Na ₂ S ₂ O ₃	Trizma	None
	Yes	No	<u>NA</u>
Shipping Container	Vista	<u>Client</u>	Retain
		<u>Return</u>	Dispose

Comments:

 FH Rinse
 S-12-M428-1
 -2
 -3
 -FB

 Imp. Cont.
 S-12-M428-1
 -2
 -3
 -FB

 Imp. Rinse
 S-12-M428-1
 -2
 -3
 -FB

 BH Rinse
 S-12-M428-1
 -2
 -3
 -FB

 M428-RB
 DI Water
 Methanol Rinse
 Toluene Rinse
 MeCl₂ Rinse



Sample Log-in Checklist

Vista Work Order #: 1800551 TAT Std

Samples Arrival:	Date/Time 4/16/18 1555	Initials: SR-JL	Location: WZ-2 Shelf/Rack: N/2
Logged In:	Date/Time 04/17/18 0958	Initials: JBL/WB	Location: R-1 Shelf/Rack: N/2
Delivered By:	FedEx	UPS	On Trac
	GSO	DHL	Hand Delivered
Other			
Preservation:	Ice	Blue Ice	Dry Ice
			None
Temp °C: 17.0 (uncorrected)	Time: 1605	Thermometer ID: IR-4	
Temp °C: 16.9 (corrected)	Probe used: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	DT-3 SR 4/16/18	

RB21 on lid

		YES	NO	NA
Adequate Sample Volume Received?		✓		
Holding Time Acceptable?		✓		
Shipping Container(s) Intact?		✓		
Shipping Custody Seals Intact?				✓
Shipping Documentation Present?				✓
Airbill	Trk #			✓
Sample Container Intact?		✓		
Sample Custody Seals Intact?				✓
Chain of Custody / Sample Documentation Present?		✓		
COC Anomaly/Sample Acceptance Form completed?			✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?				✓
Preservation Documented:	Na ₂ S ₂ O ₃	Trizma	None	Yes
				No
				NA
Shipping Container	Vista	Client	Retain	Return
				Dispose

Comments:

FH Rinse
S-1B-M428-1
-2
-3

Imp. Conts.
S-1B-M428-1
-2
-3

Imp. Rinse
S-1B-M428-1
-2
-3

BH Rinse
S-1B-M428-1
-2
-3

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APPENDIX A

DIOXINS/FURANS (PTO STACK)

4.0 Equipment Calibrations

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Isokinetic Meterbox Calibration FULL TEST

Meterbox ID: **MB25**
Calibrated by: **CO**
Date: **03/26/18**

DGM Temp Check	In	Out
DGM Temp. °F	64	65
Amb. Temp. °F	73	



Range	Low			Low Medium			Medium			High		
Run No.	1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C
Stand. Crit. Orifice (SCRIT)												
SCRIT ID#	32	32	32	48	48	48	63	63	63	73	73	73
SCRIT K' Factor	0.1473	0.1473	0.1473	0.3483	0.3483	0.3483	0.5937	0.5937	0.5937	0.8140	0.8140	0.8140
Min. SCRIT Vac., Vcr in. Hg	13	13	13	15	15	15	14	14	14	12	12	12
Amb Temp, t _{amb} °F	63	68	68	70	70	70	70	70	71	71	71	71
Bar. Pressure, P _b in. Hg	29.93	29.93	29.93	29.93	29.93	29.93	29.93	29.93	29.93	29.93	29.93	29.93
Meterbox (MB)												
Leak-check OK? (Y or N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
MB Orifice Delta H in. H ₂ O	0.12	0.12	0.12	0.67	0.67	0.67	2.00	2.00	2.00	3.75	3.75	3.75
Initial MB Vol. Reading, V _{di} acf	377.900	383.250	388.600	400.400	406.000	411.500	417.500	423.000	428.500	435.000	440.400	445.900
Final MB Vol. Reading, V _{df} acf	383.200	388.570	393.970	405.880	411.460	416.960	422.910	428.410	433.945	440.300	445.715	451.205
Difference > 5.0 cft?	5.30	5.32	5.37	5.46	5.46	5.46	5.41	5.41	5.44	5.30	5.32	5.31
Initial MB Temp, t _{di} °F	62	68	68	73	74	74	74	75	75	76	76	76
Final MB Temp, t _{df} °F	65	69	71	74	74	74	75	75	75	76	76	76
Pump Vac (> Vcr in. HG?)	18	18	18	17	17	17	16	16	16	16	16	16
Time, Minutes (M)	28	28	28	12	12	12	7	7	7	5	5	5
Time, Seconds (S)	0	0	0	0	0	0	0	0	0	0	0	0
Calculations												
M5 DGM Factor, Y _i	1.009	1.010	1.002	1.003	1.004	1.004	1.006	1.006	0.999	1.003	1.000	1.002
Y _i : 0.95 < Y _i < 1.05?			ok			ok			ok			ok
Diff = Y _{i(max)} - Y _{i(min)} Diff < ±0.010?	0.008		ok	0.001		ok	0.007		ok	0.003		ok
Average, Y _{ac(avg)}		1.007			1.004			1.004			1.002	
0.98 Y _{i(avg)} /Y _{ac(avg)} < 1.02?	0.993		ok	0.996		ok	0.996		ok	0.998		ok
Diff = Y _{i(avg)} - Y _{ac(avg)} , Diff < ±0.02?	-0.01		ok	0.00		ok	0.00		ok	0.00		ok
ΔH _{@i}	1.833	1.833	1.830	1.823	1.821	1.821	1.875	1.873	1.877	1.877	1.877	1.877
Average, ΔH _{@ac(avg)}		1.832			1.821			1.875			1.877	
Diff = ΔH _{@i(avg)} - ΔH _{@ac(avg)} , Diff < ±0.20?	0.02		ok	0.03		ok	-0.02		ok	-0.03		ok
Flow Rate, scfm*	0.19	0.19	0.19	0.45	0.45	0.45	0.77	0.77	0.77	1.05	1.05	1.05
Average Flow Rate, scfm*	0.19			0.45			0.77			1.05		
Requirements -- OK?	0.19±10%		ok	0.44±10%		ok	0.75±10%		ok	1.03±10%		ok

*Gamma Corrected at Standard Conditions. Standard Temp = 68°F, Standard Pressure = 29.92 in Hg.

$$Y_i = \frac{K'P_b \left(\frac{t_{di} + t_{df}}{2} + 460 \right) \left(M + \frac{S}{60} \right)}{17.85(V_{df} - V_{di}) \left(P_b + \frac{\Delta H}{13.6} \right) \sqrt{t_{amb} + 460}}$$

$$\Delta H_{@i} = \frac{9.926 \Delta H \left(P_b + \frac{\Delta H}{13.6} \right) (t_{amb} + 460)}{(K'P_b)^2 \left(\frac{t_{di} + t_{df}}{2} + 460 \right)}$$

Y _{i(avg)}	1.00
SCAQMD ΔH _{@(avg)}	1.88
EPA ΔH _{@(avg)}	1.85
In Range	

Notes:

Checked By: R. Leyva 3/26/18
QA Administrator (Signature/Date)

AirKinetics, Inc. * 1308 S. Allec Street * Anaheim, CA 92805 * Tel: (714)254-1945 * Fax: (714)956-2350

Updated: 4/15/05, JYO

QUARTZ NOZZLE LINER CALIBRATION

AirKinetics, Inc. * 1308 S. Allec Street * Anaheim, CA 92805 * Tel: (714)254-1945 * Fax: (714)956-2350

MAXIMUM DEVIATION ALLOWED FROM MEAN = 0.004"

LETTER ID: QP = Quartz Probe

Nozzle ID	Calib. Date	Calib. By	Dia. 1	Dia. 2	Dia. 3	Dia. 4	Dia. 5	Average	MAX DEV
6QP-1	4/28/17	MC	1.250	1.248	1.248	1.247	1.247	1.248	0.002
6QP-2	4/28/17	MC	1.268	1.268	1.267	1.269	1.267	1.268	0.001
6QP-3	4/28/17	MC	1.252	1.251	1.250	1.251	1.250	1.251	0.001
6QP-4	4/28/17	MC	1.254	1.254	1.256	1.256	1.258	1.256	0.002
6QP-5	4/28/17	MC	1.257	1.258	1.258	1.257	1.256	1.257	0.001
6QP-6	4/28/17	MC	1.248	1.249	1.249	1.250	1.251	1.249	0.002
6QP-7	4/28/17	MC	1.256	1.255	1.255	1.258	1.259	1.257	0.002
6QP-8	4/28/17	MC	1.257	1.257	1.253	1.254	1.257	1.256	0.003
3QP-1	3/30/18	KL	0.751	0.750	0.750	0.752	0.751	0.751	0.001
3QP-2	03/30/18	KL	0.746	0.745	0.746	0.746	0.746	0.746	0.000
3QP-3	3/30/18	KL	0.755	0.757	0.758	0.755	0.756	0.756	0.000

Note: 1. All diameters measured in inches

2. Maximum 0.004 from lowest to highest diameter

AirKinetics, Inc. Page 15/1/2018

DIGITAL TOPLOADER CALIBRATION

Symmetry ED2000

Balance No.: ED2000 (DT#8)

Date: October 4, 2017

Laboratory Temperature: 71° F

Barometric Pressure: 29.85" Hg

Relative Humidity: 31%

Initials: VM

Time: 10:58

<u>NIST Traceable Weights (g)</u>	<u>Balance Reading (g)</u>	<u>% Deviation</u>
0.5	0.5	0.0000%
2	2.0	0.0000%
10	10.0	0.0000%
50	50.0	0.0000%
100	100.0	0.0000%
300	300.0	0.0000%
500	500.1	0.0200%
1000	1000.4	0.0400%
1300	1300.5	0.0385%
1500	1500.6	0.0400%
2000	2000.6	0.0300%

$$\% \text{ Deviation} = \frac{\left| \text{NIST Traceable Weights} - \text{Balance Reading} \right|}{\text{NIST Traceable Weights}} \times 100$$

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APPENDIX B

DIOXINS/FURANS (BACKGROUND)

1.0 Results Tabulation and Calculations

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Site Information

Location: Torrance,	Site ID: NA	Date: 3-Apr-18
Sampler: TE-1004	Serial No: 1667	Tech: Randy Vorick

Site Conditions

Barometric Pressure (in Hg): 29.90	Corrected Pressure (mm Hg): 759.5
Temperature (deg F): 68.0	Temperature (deg K): 293.2
Average Pressure (in Hg): 29.90	Corrected Average Pressure (mm Hg): 759.5
Average Temperature (deg F): 68.0	Average Temperature (deg K): 293.2

Calibration Orifice

Make: Tisch	Qstd Slope: 9.88122
Model: TE-5040A	Qstd Intercept: -0.03577
Serial#: 0665	Calibration Due Date: 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
2	6.70	0.268	60.0	7.81	Intercept: -1.4648
3	5.90	0.251	50.0	7.13	Corr. Coeff: 0.9975
4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	# of Observations: 5

Calculations

$Qstd = 1/m[\sqrt{(H_2O)(P_a/760)(298/T_a)}] - b$
 Flow (corrected) = $\sqrt{(magn)(P_a/P_{std})(T_{std}/T_a)}$

Qstd = standard flow rate
 Flow (magn) = reading from magnehelic gauge
 Flow (corrected) = corrected flow rate
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 T_a = actual temperature during calibration (deg K)
 P_a = actual pressure during calibration (mm Hg)
 T_{std} = 298 deg K
 P_{std} = 760 mm Hg
 For subsequent calculation of sampler flow:
 $Qstd = 1/m[\sqrt{(H_2O)(P_a/760)(298/T_a)}] - b$

m = sampler slope
 b = sampler intercept
 (magn) = magnehelic reading
 T_a = daily average temperature
 P_a = daily average pressure

Sample ID: A - MTO9 - 2

Average Flow (magn):	50.0
Average Flow Over Sample (m3/min)	0.248770
Enter Total Time (hrs):	24.3
Total Flow Over Sample (m3)	362.8558959
Total Flow Over Sample (liters)	362855.8959

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-1000 PUF Calibration Worksheet

Site Information

Location: Torrance, **Site ID:** NA **Date:** 3-Apr-18
Sampler: TE-1004 **Serial No:** 1667 **Tech:** Randy Vorick

Site Conditions

Barometric Pressure (in Hg):	29.90	Corrected Pressure (mm Hg):	759.5
Temperature (deg F):	68.0	Temperature (deg K):	293.2
Average Pressure (in Hg):	29.90	Corrected Average Pressure (mm Hg):	759.5
Average Temperature (deg F):	68.0	Average Temperature (deg K):	293.2

Calibration Orifice

Make: Tisch **Qstd Slope:** 9.88122
Model: TE-5040A **Qstd Intercept:** -0.03577
Serial#: 0665 **Calibration Due Date:** 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
2	6.70	0.268	60.0	7.81	Intercept: -1.4648
3	5.90	0.251	50.0	7.13	Corr. Coeff: 0.9975
4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$
 $\text{Flow (corrected)} = \text{Sqrt}((\text{magn})(Pa/Pstd)(Tstd/Ta))$

m = sampler slope
 b = sampler intercept
 (magn) = magnehelic reading
 T_{av} = daily average temperature
 P_{av} = daily average pressure

$Qstd$ = standard flow rate
 Flow (magn) = reading from magnehelic gauge
 Flow (corrected) = corrected flow rate
 m = calibrator $Qstd$ slope
 b = calibrator $Qstd$ intercept
 T_a = actual temperature during calibration (deg K)
 P_a = actual pressure during calibration (mm Hg)
 $Tstd$ = 298 deg K
 $Pstd$ = 760 mm Hg
 For subsequent calculation of sampler flow:
 $Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$

Sample ID: A - MT09 - 3

Average Flow (magn): 50.0
Average Flow Over Sample (m3/min)
 0.248770
Enter Total Time (hrs): 24.0
Total Flow Over Sample (m3)
 358.2287743
Total Flow Over Sample (liters)
 358228.7743

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-1000 PUF Calibration Worksheet

Site Information

Location: Torrance, **Site ID:** NA **Date:** 3-Apr-18
Sampler: TE-1004 **Serial No:** 1667 **Tech:** Randy Vorick

Site Conditions

Barometric Pressure (in Hg):	29.90	Corrected Pressure (mm Hg):	759.5
Temperature (deg F):	68.0	Temperature (deg K):	293.2
Average Pressure (in Hg):	29.90	Corrected Average Pressure (mm Hg):	759.5
Average Temperature (deg F):	68.0	Average Temperature (deg K):	293.2

Calibration Orifice

Make: Tisch	Qstd Slope: 9.88122
Model: TE-5040A	Qstd Intercept: -0.03577
Serial#: 0665	Calibration Due Date: 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
2	6.70	0.268	60.0	7.81	Intercept: -1.4648
3	5.90	0.251	50.0	7.13	Corr. Coeff: 0.9975
4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$
 $\text{Flow (corrected)} = \text{Sqrt}((\text{magn})(Pa/Pstd)(Tstd/Ta))$

Qstd = standard flow rate
 Flow (magn) = reading from magnehelic gauge
 Flow (corrected) = corrected flow rate
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$

m = sampler slope
 b = sampler intercept
 (magn) = magnehelic reading
 Tav = daily average temperature
 Pav = daily average pressure

Sample ID: A - MT09 - 4

Average Flow (magn):	47.5
Average Flow Over Sample (m3/min)	0.243545
Enter Total Time (hrs):	24.0
Total Flow Over Sample (m3)	350.7047152
Total Flow Over Sample (liters)	350704.7152

NOTE: Ensure calibration orifice has been certified within 12 months of use

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

ANALYTICAL DATA			A-MT09-2		A-MT09-3		A-MT09-4		Conversion
	Compound	Unit	Pre	Amt	Pre	Amt	Pre	Amt	Factor
1	2,3,7,8-TCDD	pg	<	1.05	<	1.69	<	1.85	1E+12
2	Total TCDD	pg	<	1.05	<	1.7	<	1.9	1E+12
3	1,2,3,7,8-PeCDD	pg	<	2.72	<	2.85	<	2.39	1E+12
4	Total PeCDD	pg	<	2.72	<	2.85	<	2.39	1E+12
5	1,2,3,4,7,8-HxCDD	pg	<	2.95	<	3.42	<	3.71	1E+12
6	1,2,3,6,7,8-HxCDD	pg	<	2.95	<	3.28	<	3.56	1E+12
7	1,2,3,7,8,9-HxCDD	pg	<	2.95	<	3.34	<	3.63	1E+12
8	Total HxCDD	pg	<	2.95	<	3.35		15.9	1E+12
9	1,2,3,4,6,7,8-HpCDD	pg	<	15.8		21.1		31.7	1E+12
10	Total HpCDD	pg		26.5		51.2		77.5	1E+12
11	OCDD	pg		237		177		229	1E+12
12	2,3,7,8-TCDF	pg	<	1.43	<	1.47	<	3.10	1E+12
13	Total TCDF	pg	<	1.43	<	1.47		19.2	1E+12
14	1,2,3,7,8-PeCDF	pg	<	2.11	<	2.54	<	2.01	1E+12
15	2,3,4,7,8-PeCDF	pg	<	2.19	<	2.65	<	2.09	1E+12
16	Total PeCDF	pg		4.37	<	3.57	<	15.3	1E+12
17	1,2,3,4,7,8-HxCDF	pg	<	1.92	<	1.81	<	1.99	1E+12
18	1,2,3,6,7,8-HxCDF	pg	<	1.73	<	1.62	<	1.79	1E+12
19	2,3,4,6,7,8-HxCDF	pg	<	1.91	<	1.80	<	1.98	1E+12
20	1,2,3,7,8,9-HxCDF	pg	<	2.17	<	2.04	<	2.25	1E+12
21	Total HxCDF	pg		6.09		4.47		24.2	1E+12
22	1,2,3,4,6,7,8-HpCDF	pg		7.21		8.64		9.73	1E+12
23	1,2,3,4,7,8,9-HpCDF	pg	<	3.18	<	2.91	<	1.95	1E+12
24	Total HpCDF	pg		12.6		15.4		9.73	1E+12
25	OCDF	pg	<	7.66	<	7.31	<	14.5	1E+12

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-2
 Run End Date: 04/05/18

Total Flow Over Sample, m³ 362.8558959

Parameter	Catch Weight (pg)	Concentrations		
		(pg/m ³)	(ng/m ³)	
PCDDs				
2,3,7,8-TCDD	1.05	0.00289	2.89E-06	
Other TCDD	0	0.00000	0.00E+00	
1,2,3,7,8-PeCDD	2.72	0.00750	7.50E-06	
Other PeCDD	0	0.00000	0.00E+00	
1,2,3,4,7,8-HxCDD	2.95	0.00813	8.13E-06	
1,2,3,6,7,8-HxCDD	2.83	0.00780	7.80E-06	
1,2,3,7,8,9-HxCDD	2.88	0.00794	7.94E-06	
Other HxCDD	0	0.00000	0.00E+00	
1,2,3,4,6,7,8-HpCDD	16.8	0.04630	4.63E-05	
Other HpCDD	11.7	0.03224	3.22E-05	
OCDD	237	0.65315	6.53E-04	
TOTAL PCDDs	277.93	0.76595	7.66E-04	
PCDFs				
2,3,7,8-TCDF	1.43	0.00394	3.94E-06	
Other TCDF	0	0.00000	0.00E+00	
1,2,3,7,8-PeCDF	2.11	0.00581	5.81E-06	
2,3,4,7,8-PeCDF	2.19	0.00604	6.04E-06	
Other PeCDF	0.17	0.00047	4.69E-07	
1,2,3,4,7,8-HxCDF	1.92	0.00529	5.29E-06	
1,2,3,6,7,8-HxCDF	1.73	0.00477	4.77E-06	
2,3,4,6,7,8-HxCDF	1.91	0.00526	5.26E-06	
1,2,3,7,8,9-HxCDF	2.17	0.00598	5.98E-06	
Other HxCDF	0	0.00000	0.00E+00	
1,2,3,4,6,7,8-HpCDF	7.21	0.01987	1.99E-05	
1,2,3,4,7,8,9-HpCDF	3.18	0.00876	8.76E-06	
Other HpCDF	2.21	0.00609	6.09E-06	
OCDF	7.66	0.02111	2.11E-05	
TOTAL PCDFs	33.89	0.09340	9.34E-05	
TOTAL PCDDs and PCDFs	311.82	0.85935	8.59E-04	

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-3
 Run End Date: 04/06/18

Total Flow Over Sample, m³ 358.2287743

Parameter	Catch Weight	Concentrations	Concentrations
	(pg)	(pg/m ³)	(ng/m ³)
PCDDs			
2,3,7,8-TCDD	1.69	0.00472	4.18E-07
Other TCDD	0	0.00000	0.00E+00
1,2,3,7,8-PeCDD	2.85	0.00796	7.05E-07
Other PeCDD	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDD	3.42	0.00955	8.46E-07
1,2,3,6,7,8-HxCDD	3.28	0.00916	8.11E-07
1,2,3,7,8,9-HxCDD	3.34	0.00932	8.26E-07
Other HxCDD	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDD	21.1	0.05890	5.22E-06
Other HpCDD	30.1	0.08402	7.45E-06
OCDD	177	0.49410	4.38E-05
TOTAL PCDDs	242.78	0.67772	6.01E-05
PCDFs			
2,3,7,8-TCDF	1.47	0.00410	3.64E-07
Other TCDF	0	0.00000	0.00E+00
1,2,3,7,8-PeCDF	2.54	0.00709	6.28E-07
2,3,4,7,8-PeCDF	2.65	0.00740	6.56E-07
Other PeCDF	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDF	1.81	0.00505	4.48E-07
1,2,3,6,7,8-HxCDF	1.62	0.00452	4.01E-07
2,3,4,6,7,8-HxCDF	1.8	0.00502	4.45E-07
1,2,3,7,8,9-HxCDF	2.04	0.00569	5.05E-07
Other HxCDF	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDF	8.64	0.02412	2.14E-06
1,2,3,4,7,8,9-HpCDF	2.91	0.00812	7.20E-07
Other HpCDF	3.85	0.01075	9.52E-07
OCDF	7.31	0.02041	1.81E-06
TOTAL PCDFs	36.64	0.10228	9.06E-06
TOTAL PCDDs and PCDFs	279.42	0.78000	6.91E-05

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-4
 Run End Date: 04/10/18

Total Flow Over Sample, m³ 350.7047152

Parameter	Catch Weight (pg)	Concentrations	Concentrations	
		(pg/m ³)	(ng/m ³)	
PCDDs				
2,3,7,8-TCDD	1.85	0.00528	6.42E-07	
Other TCDD	0	0.00000	0.00E+00	
1,2,3,7,8-PeCDD	2.39	0.00681	8.29E-07	
Other PeCDD	0	0.00000	0.00E+00	
1,2,3,4,7,8-HxCDD	3.71	0.01058	1.29E-06	
1,2,3,6,7,8-HxCDD	3.56	0.01015	1.23E-06	
1,2,3,7,8,9-HxCDD	3.63	0.01035	1.26E-06	
Other HxCDD	5	0.01426	1.73E-06	
1,2,3,4,6,7,8-HpCDD	31.7	0.09039	1.10E-05	
Other HpCDD	45.8	0.13059	1.59E-05	
OCDD	229	0.65297	7.94E-05	
TOTAL PCDDs	326.64	0.93138	1.13E-04	
PCDFs				
2,3,7,8-TCDF	3.1	0.00884	1.08E-06	
Other TCDF	16.1	0.04591	5.58E-06	
1,2,3,7,8-PeCDF	2.01	0.00573	6.97E-07	
2,3,4,7,8-PeCDF	2.09	0.00596	7.25E-07	
Other PeCDF	12.2	0.03479	4.23E-06	
1,2,3,4,7,8-HxCDF	1.99	0.00567	6.90E-07	
1,2,3,6,7,8-HxCDF	1.79	0.00510	6.21E-07	
2,3,4,6,7,8-HxCDF	1.98	0.00565	6.87E-07	
1,2,3,7,8,9-HxCDF	2.25	0.00642	7.80E-07	
Other HxCDF	16.19	0.04616	5.61E-06	
1,2,3,4,6,7,8-HpCDF	9.73	0.02774	3.37E-06	
1,2,3,4,7,8,9-HpCDF	1.95	0.00556	6.76E-07	
Other HpCDF	0	0.00000	0.00E+00	
OCDF	14.5	0.04135	5.03E-06	
TOTAL PCDFs	85.88	0.24488	2.98E-05	
TOTAL PCDDs and PCDFs	412.52	1.17626	1.43E-04	



TE-1000 PUF Calibration Worksheet

Site Information

Location: Torrance,
Sampler: TE-1004

Site ID: NA
Serial No: 1667

Date: 3-Apr-18
Tech: Randy Vorick

Site Conditions

Barometric Pressure (in Hg):	29.90	Corrected Pressure (mm Hg):	759.5
Temperature (deg F):	68.0	Temperature (deg K):	293.2
Average Pressure (in Hg):	29.90	Corrected Average Pressure (mm Hg):	759.5
Average Temperature (deg F):	68.0	Average Temperature (deg K):	293.2

Calibration Orifice

Make: Tisch
Model: TE-5040A
Serial#: 0665

Qstd Slope: 9.88122
Qstd Intercept: -0.03577
Calibration Due Date: 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
2	6.70	0.268	60.0	7.81	Intercept: -1.4648
3	5.90	0.251	50.0	7.13	Corr. Coeff: 0.9975
4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$
Flow (corrected) = $\text{Sqrt}((\text{magn})(Pa/Pstd)(Tstd/Ta))$

m = sampler slope
b = sampler intercept
(magn) = magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Qstd = standard flow rate
Flow (magn) = reading from magnehelic gauge
Flow (corrected) = corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
 $Qstd = 1/m[\text{Sqrt}((H_2O)(Pa/760)(298/Ta))-b]$

Sample ID: A - MT09 - 5

Average Flow (magn):	47.5
Average Flow Over Sample (m3/min)	0.243545
Enter Total Time (hrs):	24.0
Total Flow Over Sample (m3)	350.7047152
Total Flow Over Sample (liters)	350704.7152

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-1000 PUF Calibration Worksheet

Site Information

Location: Torrance,
Sampler: TE-1004

Site ID: NA
Serial No: 1667

Date: 3-Apr-18
Tech: Randy Vorick

Site Conditions

Barometric Pressure (in Hg): 29.90
Temperature (deg F): 68.0
Average Pressure (in Hg): 29.90
Average Temperature (deg F): 68.0

Corrected Pressure (mm Hg): 759.5
Temperature (deg K): 293.2
Corrected Average Pressure (mm Hg): 759.5
Average Temperature (deg K): 293.2

Calibration Orifice

Make: Tisch
Model: TE-5040A
Serial#: 0665

Qstd Slope: 9.88122
Qstd Intercept: -0.03577
Calibration Due Date: 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
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4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}((H2O)(Pa/760)(298/Ta))-b]$
Flow (corrected) = $\text{Sqrt}((\text{magn})(Pa/Pstd)(Tstd/Ta))$

m = sampler slope
b = sampler intercept
(magn) = magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Qstd = standard flow rate
Flow (magn) = reading from magnehelic gauge
Flow (corrected) = corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
 $Qstd = 1/m[\text{Sqrt}((H2O)(Pa/760)(298/Ta))-b]$

Sample ID: A - MT09 - 6

Average Flow (magn): 50.0
Average Flow Over Sample (m3/min)
0.248770
Enter Total Time (hrs): 24.0
Total Flow Over Sample (m3)
358.2287743
Total Flow Over Sample (liters)
358228.7743

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-1000 PUF Calibration Worksheet

Site Information

Location: Torrance, Site ID: NA Date: 3-Apr-18
 Sampler: TE-1004 Serial No: 1667 Tech: Randy Vorick

Site Conditions

Barometric Pressure (in Hg):	29.90	Corrected Pressure (mm Hg):	759.5
Temperature (deg F):	68.0	Temperature (deg K):	293.2
Average Pressure (in Hg):	29.90	Corrected Average Pressure (mm Hg):	759.5
Average Temperature (deg F):	68.0	Average Temperature (deg K):	293.2

Calibration Orifice

Make: Tisch Qstd Slope: 9.88122
 Model: TE-5040A Qstd Intercept: -0.03577
 Serial#: 0665 Calibration Due Date: 26-Jul-17

Calibration Information

Plate or Test #	Pressure (in H ₂ O)	Qstd (m3/min)	Flow (magn)	Flow (corrected)	Linear Regression
1	7.60	0.285	70.0	8.43	Slope: 34.5364
2	6.70	0.268	60.0	7.81	Intercept: -1.4648
3	5.90	0.251	50.0	7.13	Corr. Coeff: 0.9975
4	4.90	0.229	40.0	6.37	
5	3.70	0.200	30.0	5.52	

of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}((H2O)(Pa/760)(298/Ta))-b]$
 $\text{Flow (corrected)} = \text{Sqrt}((\text{magn})(Pa/Pstd)(Tstd/Ta))$

m = sampler slope
 b = sampler intercept
 (magn) = magnehelic reading
 Tav = daily average temperature
 Pav = daily average pressure

Sample ID: A - MTO9 - 7

Qstd = standard flow rate
 Flow (magn) = reading from magnehelic gauge
 Flow (corrected) = corrected flow rate
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $Qstd = 1/m[\text{Sqrt}((H2O)(Pa/760)(298/Ta))-b]$

Average Flow (magn): 45.0
 Average Flow Over Sample (m3/min): 0.238180
 Enter Total Time (hrs): 24.0
 Total Flow Over Sample (m3): 342.9799089
 Total Flow Over Sample (liters): 342979.9089

NOTE: Ensure calibration orifice has been certified within 12 months of use

Tisch Environmental 145 South Miami Ave, Cleves OH 45002 • 877.263.7610 • sales@tisch-env.com • www.tisch-env.com

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: CARB 428

ANALYTICAL DATA			A-MT09-5		A-MT09-6		A-MT09-7		Conversion
	Compound	Unit	Pre	Amt	Pre	Amt	Pre	Amt	Factor
1	2,3,7,8-TCDD	pg	<	4.92	<	1.24	<	1.15	1E+12
2	Total TCDD	pg	<	4.92	<	1.24	<	1.15	1E+12
3	1,2,3,7,8-PeCDD	pg	<	12.8	<	2.38	<	2.67	1E+12
4	Total PeCDD	pg	<	12.8	<	2.38	<	2.67	1E+12
5	1,2,3,4,7,8-HxCDD	pg	<	9.13	<	3.46	<	3.40	1E+12
6	1,2,3,6,7,8-HxCDD	pg	<	8.76	<	3.22	<	3.26	1E+12
7	1,2,3,7,8,9-HxCDD	pg	<	8.92	<	3.38	<	3.32	1E+12
8	Total HxCDD	pg	<	8.92	<	3.38	<	3.3	1E+12
9	1,2,3,4,6,7,8-HpCDD	pg	<	49.7	<	28.3	<	24.9	1E+12
10	Total HpCDD	pg	<	49.7	<	28.3	<	24.9	1E+12
11	OCDD	pg	<	1.16	<	0.66	<	0.68	1E+12
12	2,3,7,8-TCDF	pg	<	4.76	<	1.47	<	1.30	1E+12
13	Total TCDF	pg	<	4.76	<	1.47	<	1.30	1E+12
14	1,2,3,7,8-PeCDF	pg	<	10.4	<	1.65	<	2.79	1E+12
15	2,3,4,7,8-PeCDF	pg	<	10.3	<	2.03	<	2.91	1E+12
16	Total PeCDF	pg	<	10.3	<	2.03	<	2.85	1E+12
17	1,2,3,4,7,8-HxCDF	pg	<	5.29	<	2.35	<	2.15	1E+12
18	1,2,3,6,7,8-HxCDF	pg	<	4.76	<	2.11	<	1.93	1E+12
19	2,3,4,6,7,8-HxCDF	pg	<	5.26	<	2.34	<	2.14	1E+12
20	1,2,3,7,8,9-HxCDF	pg	<	5.97	<	2.65	<	2.42	1E+12
21	Total HxCDF	pg	<	19.6	<	9.42	<	4.05	1E+12
22	1,2,3,4,6,7,8-HpCDF	pg	<	9.20	<	10.2	<	8.64	1E+12
23	1,2,3,4,7,8,9-HpCDF	pg	<	9.44	<	1.80	<	2.25	1E+12
24	Total HpCDF	pg	<	15.1	<	10.2	<	13.7	1E+12
25	OCDF	pg	<	13.9	<	16.3	<	21.4	1E+12

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-5
 Run End Date: 04/11/18

Total Flow Over Sample, m³ 350.7047152

Parameter	Catch Weight (pg)	Concentrations (pg/m ³)	Concentrations (ng/m ³)
PCDDs			
2,3,7,8-TCDD	4.92	0.01403	1.40E-05
Other TCDD	0	0.00000	0.00E+00
1,2,3,7,8-PeCDD	12.8	0.03650	3.65E-05
Other PeCDD	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDD	9.13	0.02603	2.60E-05
1,2,3,6,7,8-HxCDD	8.76	0.02498	2.50E-05
1,2,3,7,8,9-HxCDD	8.92	0.02543	2.54E-05
Other HxCDD	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDD	49.7	0.14171	1.42E-04
Other HpCDD	66.3	0.18905	1.89E-04
OCDD	306	0.87253	8.73E-04
TOTAL PCDDs	466.53	1.33026	1.33E-03
PCDFs			
2,3,7,8-TCDF	4.76	0.01357	1.36E-05
Other TCDF	0	0.00000	0.00E+00
1,2,3,7,8-PeCDF	10.4	0.02965	2.97E-05
2,3,4,7,8-PeCDF	10.9	0.03108	3.11E-05
Other PeCDF	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDF	5.29	0.01508	1.51E-05
1,2,3,6,7,8-HxCDF	4.76	0.01357	1.36E-05
2,3,4,6,7,8-HxCDF	5.26	0.01500	1.50E-05
1,2,3,7,8,9-HxCDF	5.97	0.01702	1.70E-05
Other HxCDF	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDF	9.2	0.02623	2.62E-05
1,2,3,4,7,8,9-HpCDF	9.44	0.02692	2.69E-05
Other HpCDF	0	0.00000	0.00E+00
OCDF	13.9	0.03963	3.96E-05
TOTAL PCDFs	79.88	0.22777	2.28E-04
TOTAL PCDDs and PCDFs	546.41	1.55803	1.56E-03

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-6
 Run End Date: 04/12/18

Total Flow Over Sample, m³ 358.2287743

Parameter	Catch Weight (pg)	Concentrations (pg/m ³)	Concentrations (ng/m ³)
PCDDs			
2,3,7,8-TCDD	1.24	0.00346	3.46E-06
Other TCDD	0	0.00000	0.00E+00
1,2,3,7,8-PeCDD	2.38	0.00664	6.64E-06
Other PeCDD	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDD	3.36	0.00938	9.38E-06
1,2,3,6,7,8-HxCDD	3.22	0.00899	8.99E-06
1,2,3,7,8,9-HxCDD	3.28	0.00916	9.16E-06
Other HxCDD	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDD	28.3	0.07900	7.90E-05
Other HpCDD	40.3	0.11250	1.12E-04
OCDD	241	0.67275	6.73E-04
TOTAL PCDDs	323.08	0.90188	9.02E-04
PCDFs			
2,3,7,8-TCDF	1.47	0.00410	4.10E-06
Other TCDF	0	0.00000	0.00E+00
1,2,3,7,8-PeCDF	1.95	0.00544	5.44E-06
2,3,4,7,8-PeCDF	2.03	0.00567	5.67E-06
Other PeCDF	0.24	0.00067	6.70E-07
1,2,3,4,7,8-HxCDF	2.35	0.00656	6.56E-06
1,2,3,6,7,8-HxCDF	2.11	0.00589	5.89E-06
2,3,4,6,7,8-HxCDF	2.34	0.00653	6.53E-06
1,2,3,7,8,9-HxCDF	2.65	0.00740	7.40E-06
Other HxCDF	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDF	10.2	0.02847	2.85E-05
1,2,3,4,7,8,9-HpCDF	1.8	0.00502	5.02E-06
Other HpCDF	0	0.00000	0.00E+00
OCDF	16.3	0.04550	4.55E-05
TOTAL PCDFs	43.44	0.12126	1.21E-04
TOTAL PCDDs and PCDFs	366.52	1.02315	1.02E-03

Plant Name: Plane Name
 Sampling Location: Test Location
 Run Number: A-MT09-7
 Run End Date: 04/13/18

Total Flow Over Sample, m³ 342.9799089

Parameter	Catch Weight (pg)	Concentrations (pg/m ³)	Concentrations (ng/m ³)
PCDDs			
2,3,7,8-TCDD	1.15	0.00335	3.35E-06
Other TCDD	0	0.00000	0.00E+00
1,2,3,7,8-PeCDD	2.67	0.00778	7.78E-06
Other PeCDD	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDD	3.4	0.00991	9.91E-06
1,2,3,6,7,8-HxCDD	3.26	0.00950	9.50E-06
1,2,3,7,8,9-HxCDD	3.32	0.00968	9.68E-06
Other HxCDD	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDD	24.9	0.07260	7.26E-05
Other HpCDD	33.9	0.09884	9.88E-05
OCDD	253	0.73765	7.38E-04
TOTAL PCDDs	325.60	0.94933	9.49E-04
PCDFs			
2,3,7,8-TCDF	1.3	0.00379	3.79E-06
Other TCDF	0	0.00000	0.00E+00
1,2,3,7,8-PeCDF	2.79	0.00813	8.13E-06
2,3,4,7,8-PeCDF	2.91	0.00848	8.48E-06
Other PeCDF	0	0.00000	0.00E+00
1,2,3,4,7,8-HxCDF	2.15	0.00627	6.27E-06
1,2,3,6,7,8-HxCDF	1.93	0.00563	5.63E-06
2,3,4,6,7,8-HxCDF	2.14	0.00624	6.24E-06
1,2,3,7,8,9-HxCDF	2.42	0.00706	7.06E-06
Other HxCDF	0	0.00000	0.00E+00
1,2,3,4,6,7,8-HpCDF	8.64	0.02519	2.52E-05
1,2,3,4,7,8,9-HpCDF	2.25	0.00656	6.56E-06
Other HpCDF	2.81	0.00819	8.19E-06
OCDF	21.4	0.06239	6.24E-05
TOTAL PCDFs	50.74	0.14794	1.48E-04
TOTAL PCDDs and PCDFs	376.34	1.09727	1.10E-03

APPENDIX A
DIOXINS/FURANS (BACKGROUND)

2.0 Field Data

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Ambient Sampler Field Data Sheet

INVALID

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3

Run 1

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/3/18	4/4/18	---
Time	10:00	10:00	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	65	85	75
Magn, (psi)	50	50-35 50	50
Recorder, (hrs)	02848.77	2872.77	24.0



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3

Run 2

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/4/18	4/6/18	---
Time	11:35 10:05	11:35	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	65	85	75
Magn, (psi)	2872.77	50	50
Recorder, (hrs)	50	2897.08	24.31



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3

Run 3

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/5/18	4/6/18	---
Time	11:45	11:45	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	65	85	75
Magn, (psi)	50	50	50
Recorder, (hrs)	2897.08	2921.08	24.0



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3 4

Run 4

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/9/18	4/10/18	---
Time	1025	1025	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	70	77	73.5
Magn, (psi)	50	45	47.5
Recorder, (hrs)	2921.08	2945.09	24.0



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3

Run 5

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	10:35	1035	---
Time	4/10/18	4/11/18	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	77	80	78.5
Magn, (psi)	50	45	47.5
Recorder, (hrs)	2945.09	2969.09	24.0



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample:

1A or 1B : 1 2 or 3

Run 6

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/11/10	4/12/10	---
Time	10:40	10:40	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	80	75	77.5
Magn, (psi)	50	50	50
Recorder, (hrs)	2969.09	2993.10	24.0



Ambient Sampler Field Data Sheet

Coca-Cola Distribution Center
Torrance, CA

Sample: 1A or 1B: 1 2 or 3 Run 7

	<u>Start</u>	<u>End</u>	<u>Avg/Elapsed</u>
Date	4/12/18	4/13/18	---
Time	10:45	10:45	---
Bar Press, (in. Hg)	29.9	29.9	29.9
Temp, (°F)	75	80	77.5
Magn, (psi)	50	40	45
Recorder, (hrs)	2993.10	3017.10	24.0



Ambient Sampler Calibration Sheet

Coca-Cola Distribution Center
Torrance, CA

Sampler ID: TE-1004, Serial 1667

Date: 4/3/18

<u>Test #</u>	<u>Magn, psi</u>	<u>Press 1</u>	<u>Press 2</u>	<u>Total Press</u>
1	70	3.9	3.7	7.6
2	60	3.4	3.3	6.7
3	50	3.0	2.9	5.9
4	40	2.5	2.4	4.9
5	30	1.9	1.8	3.7

APPENDIX A
DIOXINS/FURANS (BACKGROUND)

3.0 Analytical Data

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May 09, 2018

Vista Work Order No. 1800573

Mr. Neal Conroy
AirKinetics, Inc.
1308 S. Allec Street
Anaheim, CA 92805

Dear Mr. Conroy,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on April 16, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'AECOM/14875'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink that reads "Martha Maier".

Martha Maier
Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1800573

Case Narrative

Sample Condition on Receipt:

Six PUF samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. Samples "A-MT09-2" and "A-MT09-3" were received outside of the hold time. The client was notified by email on April 18, 2018.

Analytical Notes:

Method TO-9A

These samples were extracted and analyzed for tetra-through-octa chlorinated dioxins and furans by Method TO-9A using a ZB-5MS GC column.

Holding Times

Samples "A-MT09-2", "A-MT09-3" and "A-MT09-4" were extracted outside of the method holding time criteria.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery sample (OPR) were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The extraction glassware containing sample "A-MT09-5" developed a crack early in the extraction process and a significant amount of the extract was lost. The sample was transferred to new glassware and the extraction was re-started. The pre-spike recoveries are high for this sample, indicating that extract was lost prior to a thorough extraction of the PUF; the reported concentrations of the analytes may be biased high.

The labeled standard recoveries outside of the method acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1800573-04	A-MTO9-5	EPA Method TO-9	13C-2,3,7,8-TCDD	H	24.7
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,7,8-PeCDD	H	18.4
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,6,7,8-HxCDD	H	21.4
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,4,6,7,8-HpCDD	H	19.7
1800573-04	A-MTO9-5	EPA Method TO-9	13C-OCDD	H	15.8
1800573-04	A-MTO9-5	EPA Method TO-9	13C-2,3,7,8-TCDF	H	22.9
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,7,8-PeCDF	H	20.4
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,6,7,8-HxCDF	H	21.8
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,4,6,7,8-HpCDF	H	22.2
1800573-04	A-MTO9-5	EPA Method TO-9	13C-OCDF	H	19.4
1800573-04	A-MTO9-5	EPA Method TO-9	37Cl-2,3,7,8-TCDD	H	410
1800573-04	A-MTO9-5	EPA Method TO-9	13C-2,3,4,7,8-PeCDF	H	389
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,4,7,8-HxCDD	H	464
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,4,7,8-HxCDF	H	430
1800573-04	A-MTO9-5	EPA Method TO-9	13C-1,2,3,4,7,8,9-HpCDF	H	383

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Case Narrative.....	1
Table of Contents.....	4
Sample Inventory.....	5
Analytical Results.....	6
Qualifiers.....	15
Certifications.....	16
Sample Receipt.....	17

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800573-01	A-MTO9-2	05-Apr-18 11:35	16-Apr-18 15:55	PUF Cartridge Filter
1800573-02	A-MTO9-3	05-Apr-18 11:45	16-Apr-18 15:55	PUF Cartridge Filter
1800573-03	A-MTO9-4	10-Apr-18 10:25	16-Apr-18 15:55	PUF Cartridge Filter
1800573-04	A-MTO9-5	11-Apr-18 10:35	16-Apr-18 15:55	PUF Cartridge Filter
1800573-05	A-MTO9-6	12-Apr-18 10:40	16-Apr-18 15:55	PUF Cartridge Filter
1800573-06	A-MTO9-7	13-Apr-18 10:45	16-Apr-18 15:55	PUF Cartridge Filter

ANALYTICAL RESULTS

Sample ID: Method Blank				EPA Method TO-9				
Matrix: Air		QC Batch: B8D0125 Date Extracted: 18-Apr-2018 10:27		Lab Sample: B8D0125-BLK1 Date Analyzed: 27-Apr-18 18:08 Column: ZB-5MS				
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.29			IS 13C-2,3,7,8-TCDD	98.0	50 - 120	
1,2,3,7,8-PeCDD	ND	1.60			IS 13C-1,2,3,7,8-PeCDD	83.6	50 - 120	
1,2,3,4,7,8-HxCDD	ND	1.65			IS 13C-1,2,3,6,7,8-HxCDD	88.6	50 - 120	
1,2,3,6,7,8-HxCDD	ND	1.59			IS 13C-1,2,3,4,6,7,8-HpCDD	85.2	40 - 120	
1,2,3,7,8,9-HxCDD	ND	1.61			IS 13C-OCDD	60.4	40 - 120	
1,2,3,4,6,7,8-HpCDD	ND	2.38			IS 13C-2,3,7,8-TCDF	92.1	50 - 120	
OCDD	7.93			J	IS 13C-1,2,3,7,8-PeCDF	82.8	50 - 120	
2,3,7,8-TCDF	ND	0.951			IS 13C-1,2,3,6,7,8-HxCDF	89.9	50 - 120	
1,2,3,7,8-PeCDF	ND	1.87			IS 13C-1,2,3,4,6,7,8-HpCDF	95.8	40 - 120	
2,3,4,7,8-PeCDF	ND	1.95			IS 13C-OCDF	77.5	40 - 120	
1,2,3,4,7,8-HxCDF	ND	0.976			PS 37Cl-2,3,7,8-TCDD	97.0	50 - 120	
1,2,3,6,7,8-HxCDF	ND	0.877			PS 13C-2,3,4,7,8-PeCDF	95.3	50 - 120	
1,7,8-HxCDF	ND	0.971			PS 13C-1,2,3,4,7,8-HxCDD	110	50 - 120	
1,8,9-HxCDF	ND	1.10			PS 13C-1,2,3,4,7,8-HxCDF	104	50 - 120	
1,2,3,4,6,7,8-HpCDF	ND	1.18			PS 13C-1,2,3,4,7,8,9-HpCDF	89.7	40 - 120	
1,2,3,4,7,8,9-HpCDF	ND	1.38			AS 13C-1,2,3,7,8,9-HxCDF	91.7	50 - 120	
OCDF	ND	2.52			Toxic Equivalent Quotient (TEQ) Data			
					TEQMaxWHO2005Dioxin	4.56		
					TEQMinWHO2005Dioxin	0.00238		
Totals								
Total TCDD	ND	1.29						
Total PeCDD	ND	1.60						
Total HxCDD	ND	1.62						
Total HpCDD	ND	2.38						
Total TCDF	ND	0.951						
Total PeCDF	ND	1.91						
Total HxCDF	ND	0.975						
Total HpCDF	ND	1.27						

DL - Sample specific estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: OPR					EPA Method TO-9			
Matrix: Air		QC Batch: B8D0125 Date Extracted: 18-Apr-2018 10:27			Lab Sample: B8D0125-BS1 Date Analyzed: 27-Apr-18 15:43 Column: ZB-5MS			
Analyte	Amt Found (pg/Sample)	Spike Amt	%R	Limits	Labeled Standard		%R	LCL-UCL
2,3,7,8-TCDD	83.1	100	83.1	70 - 130	IS	13C-2,3,7,8-TCDD	109	50- 120
1,2,3,7,8-PeCDD	530	500	106	70 - 130	IS	13C-1,2,3,7,8-PeCDD	87.8	50- 120
1,2,3,4,7,8-HxCDD	453	500	90.6	70 - 130	IS	13C-1,2,3,6,7,8-HxCDD	93.7	50- 120
1,2,3,6,7,8-HxCDD	476	500	95.3	70 - 130	IS	13C-1,2,3,4,6,7,8-HpCDD	87.4	40- 120
1,2,3,7,8,9-HxCDD	459	500	91.9	70 - 130	IS	13C-OCDD	58.9	40- 120
1,2,3,4,6,7,8-HpCDD	416	500	83.1	70 - 130	IS	13C-2,3,7,8-TCDF	110	50- 120
OCDD	915	1000	91.5	70 - 130	IS	13C-1,2,3,7,8-PeCDF	91.4	50- 120
2,3,7,8-TCDF	70.2	100	70.2	70 - 130	IS	13C-1,2,3,6,7,8-HxCDF	91.1	50- 120
1,2,3,7,8-PeCDF	514	500	103	70 - 130	IS	13C-1,2,3,4,6,7,8-HpCDF	91.4	40- 120
2,3,4,7,8-PeCDF	515	500	103	70 - 130	IS	13C-OCDF	77.2	40- 120
1,2,3,4,7,8-HxCDF	450	500	90.0	70 - 130	PS	37Cl-2,3,7,8-TCDD	97.3	50- 120
1,2,3,6,7,8-HxCDF	439	500	87.7	70 - 130	PS	13C-2,3,4,7,8-PeCDF	99.1	50- 120
2,3,4,6,7,8-HxCDF	421	500	84.3	70 - 130	PS	13C-1,2,3,4,7,8-HxCDD	105	50- 120
1,8,9-HxCDF	438	500	87.7	70 - 130	PS	13C-1,2,3,4,7,8-HxCDF	102	50- 120
1,4,6,7,8-HpCDF	370	500	74.1	70 - 130	PS	13C-1,2,3,4,7,8,9-HpCDF	89.2	40- 120
1,2,3,4,7,8,9-HpCDF	385	500	77.1	70 - 130	AS	13C-1,2,3,7,8,9-HxCDF	99.4	50- 120
OCDF	691	1000	69.1	70 - 130				

LCL-UCL - Lower control limit - upper control limit

Sample ID: A-MTO9-2					EPA Method TO-9			
Client Data		Sample Data		Laboratory Data				
Name: AirKinetics, Inc.		Matrix: PUF		Lab Sample: 1800573-01		Date Received: 16-Apr-2018 15:55		
Project: AECOM/14875				QC Batch: B8D0125		Date Extracted: 18-Apr-2018 10:27		
Date Collected: 05-Apr-2018 11:35				Date Analyzed: 26-Apr-18 18:50 Column: ZB-5MS				
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.05			IS 13C-2,3,7,8-TCDD	99.5	50- 120	
1,2,3,7,8-PeCDD	ND	2.72			IS 13C-1,2,3,7,8-PeCDD	75.0	50- 120	
1,2,3,4,7,8-HxCDD	ND	2.95			IS 13C-1,2,3,6,7,8-HxCDD	85.2	50- 120	
1,2,3,6,7,8-HxCDD	ND	2.83			IS 13C-1,2,3,4,6,7,8-HpCDD	85.1	40- 120	
1,2,3,7,8,9-HxCDD	ND	2.88			IS 13C-OCDD	67.8	40- 120	
1,2,3,4,6,7,8-HpCDD	ND		16.8		IS 13C-2,3,7,8-TCDF	95.8	50- 120	
OCDD	237			B	IS 13C-1,2,3,7,8-PeCDF	84.2	50- 120	
2,3,7,8-TCDF	ND	1.43			IS 13C-1,2,3,6,7,8-HxCDF	84.6	50- 120	
1,2,3,7,8-PeCDF	ND	2.11			IS 13C-1,2,3,4,6,7,8-HpCDF	87.1	40- 120	
2,3,4,7,8-PeCDF	ND	2.19			IS 13C-OCDF	80.9	40- 120	
1,2,3,4,7,8-HxCDF	ND	1.92			PS 37Cl-2,3,7,8-TCDD	100	50- 120	
1,2,3,6,7,8-HxCDF	ND	1.73			PS 13C-2,3,4,7,8-PeCDF	97.3	50- 120	
6,7,8-HxCDF	ND	1.91			PS 13C-1,2,3,4,7,8-HxCDD	114	50- 120	
7,8,9-HxCDF	ND	2.17			PS 13C-1,2,3,4,7,8-HxCDF	107	50- 120	
1,2,3,4,6,7,8-HpCDF	7.21			J	PS 13C-1,2,3,4,7,8,9-HpCDF	95.1	40- 120	
1,2,3,4,7,8,9-HpCDF	ND	3.18			AS 13C-1,2,3,7,8,9-HxCDF	86.1	50- 120	
OCDF	ND		7.66		Toxic Equivalent Quotient (TEQ) Data			
Totals					TEQMaxWHO2005Dioxin 6.62			
Total TCDD ND 1.05					TEQMinWHO2005Dioxin 0.143			
Total PeCDD ND 2.72								
Total HxCDD ND 2.88								
Total HpCDD 28.5 45.2								
Total TCDF ND 1.43								
Total PeCDF 4.47 7.66								
Total HxCDF 6.09								
Total HpCDF 12.6								

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

EPA Method TO-9									
Sample ID: A-MTO9-3									
Client Data			Sample Data			Laboratory Data			
Name:	AirKinetics, Inc.		Matrix:	PUF		Lab Sample:	1800573-02		Date Received: 16-Apr-2018 15:55
Project:	AECOM/14875					QC Batch:	B8D0125		Date Extracted: 18-Apr-2018 10:27
Date Collected:	05-Apr-2018 11:45					Date Analyzed:	26-Apr-18 19:38 Column: ZB-5MS		
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers	
2,3,7,8-TCDD	ND	1.69			IS 13C-2,3,7,8-TCDD	94.9	50 - 120		
1,2,3,7,8-PeCDD	ND	2.85			IS 13C-1,2,3,7,8-PeCDD	66.2	50 - 120		
1,2,3,4,7,8-HxCDD	ND	3.42			IS 13C-1,2,3,6,7,8-HxCDD	81.3	50 - 120		
1,2,3,6,7,8-HxCDD	ND	3.28			IS 13C-1,2,3,4,6,7,8-HpCDD	77.0	40 - 120		
1,2,3,7,8,9-HxCDD	ND	3.34			IS 13C-OCDD	61.2	40 - 120		
1,2,3,4,6,7,8-HpCDD	21.1			J	IS 13C-2,3,7,8-TCDF	94.4	50 - 120		
OCDD	177			B	IS 13C-1,2,3,7,8-PeCDF	78.3	50 - 120		
2,3,7,8-TCDF	ND	1.47			IS 13C-1,2,3,6,7,8-HxCDF	82.9	50 - 120		
1,2,3,7,8-PeCDF	ND	2.54			IS 13C-1,2,3,4,6,7,8-HpCDF	83.4	40 - 120		
1,2,3,4,7,8-PeCDF	ND	2.65			IS 13C-OCDF	75.7	40 - 120		
1,2,3,4,7,8-HxCDF	ND	1.81			PS 37Cl-2,3,7,8-TCDD	103	50 - 120		
1,2,3,6,7,8-HxCDF	ND	1.62			PS 13C-2,3,4,7,8-PeCDF	98.3	50 - 120		
6,7,8-HxCDF	ND	1.80			PS 13C-1,2,3,4,7,8-HxCDD	115	50 - 120		
7,8,9-HxCDF	ND	2.04			PS 13C-1,2,3,4,7,8-HxCDF	108	50 - 120		
1,2,3,4,6,7,8-HpCDF	8.64			J	PS 13C-1,2,3,4,7,8,9-HpCDF	100	40 - 120		
1,2,3,4,7,8,9-HpCDF	ND	2.91			AS 13C-1,2,3,7,8,9-HxCDF	85.4	50 - 120		
OCDF	ND		7.31		Toxic Equivalent Quotient (TEQ) Data				
Totals					TEQMaxWHO2005Dioxin	7.67			
Total TCDD	ND	1.69			TEQMinWHO2005Dioxin	0.351			
Total PeCDD	ND	2.85							
Total HxCDD	ND	3.35							
Total HpCDD	51.2								
Total TCDF	ND	1.47							
Total PeCDF	ND		3.50						
Total HxCDF	4.47								
Total HpCDF	15.4								

DL - Sample specific estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: A-MTO9-4					EPA Method TO-9			
Client Data		Sample Data		Laboratory Data				
Name:	AirKinetics, Inc.	Matrix:	PUF	Lab Sample:	1800573-03	Date Received:	16-Apr-2018 15:55	
Project:	AECOM/14875			QC Batch:	B8D0125	Date Extracted:	18-Apr-2018 10:27	
Date Collected:	10-Apr-2018 10:25			Date Analyzed:	26-Apr-18 20:26	Column:	ZB-5MS	
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.85			IS 13C-2,3,7,8-TCDD	104	50 - 120	
1,2,3,7,8-PeCDD	ND	2.39			IS 13C-1,2,3,7,8-PeCDD	74.3	50 - 120	
1,2,3,4,7,8-HxCDD	ND	3.71			IS 13C-1,2,3,6,7,8-HxCDD	86.3	50 - 120	
1,2,3,6,7,8-HxCDD	ND	3.56			IS 13C-1,2,3,4,6,7,8-HpCDD	85.2	40 - 120	
1,2,3,7,8,9-HxCDD	ND	3.63			IS 13C-OCDD	70.0	40 - 120	
1,2,3,4,6,7,8-HpCDD	31.7			J	IS 13C-2,3,7,8-TCDF	100	50 - 120	
OCDD	229			B	IS 13C-1,2,3,7,8-PeCDF	86.1	50 - 120	
2,3,7,8-TCDF	ND	3.10			IS 13C-1,2,3,6,7,8-HxCDF	83.6	50 - 120	
1,2,3,7,8-PeCDF	ND	2.01			IS 13C-1,2,3,4,6,7,8-HpCDF	95.6	40 - 120	
2,3,4,7,8-PeCDF	ND	2.09			IS 13C-OCDF	84.2	40 - 120	
1,2,3,4,7,8-HxCDF	ND	1.99			PS 37Cl-2,3,7,8-TCDD	101	50 - 120	
1,2,3,6,7,8-HxCDF	ND	1.79			PS 13C-2,3,4,7,8-PeCDF	97.9	50 - 120	
1,2,4,6,7,8-HxCDF	ND	1.98			PS 13C-1,2,3,4,7,8-HxCDD	114	50 - 120	
1,8,9-HxCDF	ND	2.25			PS 13C-1,2,3,4,7,8-HxCDF	105	50 - 120	
1,4,6,7,8-HpCDF	9.73			J	PS 13C-1,2,3,4,7,8,9-HpCDF	97.5	40 - 120	
1,2,3,4,7,8,9-HpCDF	ND	1.95			AS 13C-1,2,3,7,8,9-HxCDF	93.3	50 - 120	
OCDF	ND		14.5		Toxic Equivalent Quotient (TEQ) Data			
Totals					TEQMaxWHO2005Dioxin	7.64		
Total TCDD	ND	1.85			TEQMinWHO2005Dioxin	0.483		
Total PeCDD	ND	2.39						
Total HxCDD	15.9							
Total HpCDD	77.5							
Total TCDF	19.2		23.2					
Total PeCDF	ND		16.3					
Total HxCDF	24.2							
Total HpCDF	9.73		18.5					

DL - Sample specific estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

EPA Method TO-9									
Sample ID: A-MTO9-5			Sample Data		Laboratory Data				
Client Data			Matrix: PUF		Lab Sample: 1800573-04		Date Received: 16-Apr-2018 15:55		
Name: AirKinetics, Inc.					QC Batch: B8D0125		Date Extracted: 18-Apr-2018 10:27		
Project: AECOM/14875					Date Analyzed: 26-Apr-18 21:14 Column: ZB-5MS				
Date Collected: 11-Apr-2018 10:35									
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers	
2,3,7,8-TCDD	ND	4.92			IS 13C-2,3,7,8-TCDD	24.7	50 - 120	H	
1,2,3,7,8-PeCDD	ND	12.8			IS 13C-1,2,3,7,8-PeCDD	18.4	50 - 120	H	
1,2,3,4,7,8-HxCDD	ND	9.13			IS 13C-1,2,3,6,7,8-HxCDD	21.4	50 - 120	H	
1,2,3,6,7,8-HxCDD	ND	8.76			IS 13C-1,2,3,4,6,7,8-HpCDD	19.7	40 - 120	H	
1,2,3,7,8,9-HxCDD	ND	8.92			IS 13C-OCDD	15.8	40 - 120	H	
1,2,3,4,6,7,8-HpCDD	49.7			J	IS 13C-2,3,7,8-TCDF	22.9	50 - 120	H	
OCDD	306			B	IS 13C-1,2,3,7,8-PeCDF	20.4	50 - 120	H	
2,3,7,8-TCDF	ND	4.76			IS 13C-1,2,3,6,7,8-HxCDF	21.8	50 - 120	H	
1,2,3,7,8-PeCDF	ND	10.4			IS 13C-1,2,3,4,6,7,8-HpCDF	22.2	40 - 120	H	
2,3,4,7,8-PeCDF	ND	10.9			IS 13C-OCDF	19.4	40 - 120	H	
1,2,3,4,7,8-HxCDF	ND	5.29			PS 37Cl-2,3,7,8-TCDD	410	50 - 120	H	
1,2,3,6,7,8-HxCDF	ND	4.76			PS 13C-2,3,4,7,8-PeCDF	389	50 - 120	H	
5,7,8-HxCDF	ND	5.26			PS 13C-1,2,3,4,7,8-HxCDD	464	50 - 120	H	
7,8,9-HxCDF	ND	5.97			PS 13C-1,2,3,4,7,8-HxCDF	430	50 - 120	H	
1,2,3,4,6,7,8-HpCDF	ND		9.20		PS 13C-1,2,3,4,7,8,9-HpCDF	383	40 - 120	H	
1,2,3,4,7,8,9-HpCDF	ND	9.44			AS 13C-1,2,3,7,8,9-HxCDF	87.2	50 - 120		
OCDF	ND	13.9			Toxic Equivalent Quotient (TEQ) Data				
Totals					TEQ _{Max} WHO2005Dioxin		27.4		
Total TCDD		ND	4.92		TEQ _{Min} WHO2005Dioxin		0.589		
Total PeCDD		ND	12.8						
Total HxCDD		ND	8.94						
Total HpCDD		116							
Total TCDF		ND	4.76						
Total PeCDF		ND	10.6						
Total HxCDF		19.6							
Total HpCDF		15.1		24.3					
LCL-UCL - Lower control limit - upper control limit LCL-UCL - Lower control limit - upper control limit (DL) for congeners that are not detected.									

DL - Sample specific estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: A-MTO9-6					EPA Method TO-9			
Client Data		Sample Data		Laboratory Data				
Name: AirKinetics, Inc.		Matrix: PUF		Lab Sample: 1800573-05		Date Received: 16-Apr-2018 15:55		
Project: AECOM/14875				QC Batch: B8D0125		Date Extracted: 18-Apr-2018 10:27		
Date Collected: 12-Apr-2018 10:40				Date Analyzed: 26-Apr-18 22:03 Column: ZB-5MS				
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
2,3,7,8-TCDD	ND	1.24			IS 13C-2,3,7,8-TCDD	108	50 - 120	
1,2,3,7,8-PeCDD	ND	2.38			IS 13C-1,2,3,7,8-PeCDD	75.2	50 - 120	
1,2,3,4,7,8-HxCDD	ND	3.36			IS 13C-1,2,3,6,7,8-HxCDD	87.9	50 - 120	
1,2,3,6,7,8-HxCDD	ND	3.22			IS 13C-1,2,3,4,6,7,8-HpCDD	84.5	40 - 120	
1,2,3,7,8,9-HxCDD	ND	3.28			IS 13C-OCDD	70.9	40 - 120	
1,2,3,4,6,7,8-HpCDD	28.3			J	IS 13C-2,3,7,8-TCDF	105	50 - 120	
OCDD	241			B	IS 13C-1,2,3,7,8-PeCDF	88.9	50 - 120	
2,3,7,8-TCDF	ND	1.47			IS 13C-1,2,3,6,7,8-HxCDF	81.8	50 - 120	
1,2,3,7,8-PeCDF	ND	1.95			IS 13C-1,2,3,4,6,7,8-HpCDF	101	40 - 120	
2,3,4,7,8-PeCDF	ND	2.03			IS 13C-OCDF	83.3	40 - 120	
1,2,3,4,7,8-HxCDF	ND	2.35			PS 37Cl-2,3,7,8-TCDD	96.9	50 - 120	
1,2,3,6,7,8-HxCDF	ND	2.11			PS 13C-2,3,4,7,8-PeCDF	90.4	50 - 120	
2,3,4,6,7,8-HxCDF	ND	2.34			PS 13C-1,2,3,4,7,8-HxCDD	110	50 - 120	
7,8,9-HxCDF	ND	2.65			PS 13C-1,2,3,4,7,8-HxCDF	104	50 - 120	
4,6,7,8-HpCDF	10.2			J	PS 13C-1,2,3,4,7,8,9-HpCDF	90.0	40 - 120	
1,2,3,4,7,8,9-HpCDF	ND	1.80			AS 13C-1,2,3,7,8,9-HxCDF	87.7	50 - 120	
OCDF	ND		16.3		Toxic Equivalent Quotient (TEQ) Data			
Totals					TEQMaxWHO2005Dioxin		6.85	
Total TCDD					TEQMinWHO2005Dioxin		0.457	
Total PeCDD								
Total HxCDD								
Total HpCDD								
Total TCDF								
Total PeCDF								
Total HxCDF								
Total HpCDF								

DL - Sample specific estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: A-MTO9-7					EPA Method TO-9				
Client Data			Sample Data		Laboratory Data		Date Received: 16-Apr-2018 15:55		
Name: AirKinetics, Inc.			Matrix: PUF		Lab Sample: 1800573-06		Date Extracted: 18-Apr-2018 10:27		
Project: AECOM/14875					QC Batch: B8D0125		Date Analyzed: 26-Apr-18 22:51 Column: ZB-5MS		
Date Collected: 13-Apr-2018 10:45									
Analyte	Conc. (pg/Sample)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers	
2,3,7,8-TCDD	ND	1.15		J B	IS 13C-2,3,7,8-TCDD	98.2	50 - 120		
1,2,3,7,8-PeCDD	ND	2.67			IS 13C-1,2,3,7,8-PeCDD	70.6	50 - 120		
1,2,3,4,7,8-HxCDD	ND	3.40			IS 13C-1,2,3,6,7,8-HxCDD	84.8	50 - 120		
1,2,3,6,7,8-HxCDD	ND	3.26			IS 13C-1,2,3,4,6,7,8-HpCDD	83.6	40 - 120		
1,2,3,7,8,9-HxCDD	ND	3.32			IS 13C-OCDD	69.0	40 - 120		
1,2,3,4,6,7,8-HpCDD	24.9				IS 13C-2,3,7,8-TCDF	97.6	50 - 120		
OCDD	253				IS 13C-1,2,3,7,8-PeCDF	81.7	50 - 120		
2,3,7,8-TCDF	ND	1.30			IS 13C-1,2,3,6,7,8-HxCDF	82.3	50 - 120		
1,2,3,7,8-PeCDF	ND	2.79			IS 13C-1,2,3,4,6,7,8-HpCDF	98.1	40 - 120		
2,3,4,7,8-PeCDF	ND	2.91			IS 13C-OCDF	82.3	40 - 120		
1,2,3,4,7,8-HxCDF	ND	2.15			PS 37Cl-2,3,7,8-TCDD	98.5	50 - 120		
1,2,3,6,7,8-HxCDF	ND	1.93			PS 13C-2,3,4,7,8-PeCDF	93.1	50 - 120		
6,7,8-HxCDF	ND	2.14			PS 13C-1,2,3,4,7,8-HxCDD	110	50 - 120		
7,8,9-HxCDF	ND	2.42			PS 13C-1,2,3,4,7,8-HxCDF	102	50 - 120		
1,2,3,4,6,7,8-HpCDF	ND		8.64		PS 13C-1,2,3,4,7,8,9-HpCDF	88.0	40 - 120		
1,2,3,4,7,8,9-HpCDF	ND	2.25			AS 13C-1,2,3,7,8,9-HxCDF	86.1	50 - 120		
OCDF	ND		21.4			Toxic Equivalent Quotient (TEQ) Data			
Totals					TEQMaxWHO2005Dioxin 7.21				
Total TCDD	ND	1.15				TEQMinWHO2005Dioxin 0.325			
Total PeCDD	ND	2.67							
Total HxCDD	ND	3.33							
Total HpCDD	58.8								
Total TCDF	ND	1.30							
Total PeCDF	ND	2.85							
Total HxCDF	ND		4.05						
Total HpCDF	ND		13.7						

LCL-UCL - Lower control limit - upper control limit
and detection limit (DL) for congeners that are not detected.

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit
 Max-The TEQ is calculated using the detection limit (DL) for congeners that are not detected.
 Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank.
D	Dilution
E	The associated compound concentration exceeded the calibration range of the instrument.
H	Recovery and/or RPD was outside laboratory acceptance limits.
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ.
M	Estimated Maximum Possible Concentration. (CA Region 2 projects only)
*	See Cover Letter
Conc.	Concentration
NA	Not applicable
ND	Not Detected
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

1800543

7.9°C

Page 1 of 1

PO Number: 8419-NC

Sample Chain of Custody Record

Project Name: AECOM		AKI PM: Neal Conroy		Analyses Required										Comments			
Location: Torrance, CA		PM Phone: (714) 254-1945; Ext. 210															
Project No.: 14875		PM email: conroy@airkineticsinc.com															
<input type="checkbox"/> Full Data Package With Report		Results to: akisublab@airkineticsinc.com															
End Date	End Time	Sample ID	Component	Matrix	EPA TO-8 Dioxins / Furans												
4/10/2018	1025	A - MTO9 - 4	Filter		✓												
			PUF Cartridge		✓												
4/11/2018	1035	A - MTO9 - 5	Filter		✓												
			PUF Cartridge		✓												
4/12/2018	1040	A - MTO9 - 6	Filter		✓												
			PUF Cartridge		✓												
4/13/2018	1045	A - MTO9 - 7	Filter		✓												
			PUF Cartridge		✓												
4/14/2018	1200	MTO9 - FB	Filter		✓												
			PUF Cartridge		✓												
TAT: Std - 3 Weeks		Relinquished by: (Sign & Print) <i>Martha Maier</i>		Date/Time 15:30 4/13/18	Locked Storage <input type="checkbox"/>		Received by: (Sign & Print) <i>Sydney Kornblum</i> <i>Jody Kornblum</i>		Date/Time 1600 4/16/18								
Ship to: Martha Maier Vista Analytical 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520					<input type="checkbox"/>												



AirKinetics, Inc.
1308 South Allec Street
Anaheim, CA 92805
(714) 254-1945

Work Order 1800573

Page 17 of 20



Sample Log-in Checklist

Vista Work Order #: 1800573 TAT Std

Samples Arrival:	Date/Time 4/16/18 1555		Initials: SR		Location: WR-2	
					Shelf/Rack: N/A	
Logged In:	Date/Time 4/17/18 0746		Initials: RAB		Location: WR-2 R-1	
					Shelf/Rack: NA	
Delivered By:	FedEx	UPS	On Trac	GSO	DHL	<u>Hand Delivered</u>
Preservation:	Ice		<u>Blue Ice</u>		Dry Ice	
					None	
Temp °C: 7.9 (uncorrected)			Time: 1620		Thermometer ID: HR-4 ^{SR 4/16/18}	
Temp °C: 7.9 (corrected)			Probe used: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		DT-3	

blue cooler

	YES	NO	NA
Adequate Sample Volume Received?	<input checked="" type="checkbox"/>		
Holding Time Acceptable?	<input checked="" type="checkbox"/>		
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>		
Shipping Custody Seals Intact?			<input checked="" type="checkbox"/>
Shipping Documentation Present?			<input checked="" type="checkbox"/>
Airbill			<input checked="" type="checkbox"/>
Trk #			
Sample Container Intact?	<input checked="" type="checkbox"/>		
Sample Custody Seals Intact?			<input checked="" type="checkbox"/>
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>		
COC Anomaly/Sample Acceptance Form completed?	<input checked="" type="checkbox"/>		
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			<input checked="" type="checkbox"/>
Preservation Documented:	Na ₂ S ₂ O ₃	Trizma	None
	Yes	No	<u>NA</u>
Shipping Container	<u>Vista</u>	<u>Client</u>	Retain
	<u>Return</u>	Dispose	

Comments: Received 7 unused filters and petri dishes SR 4/16/18

Chain of Custody Anomaly/Sample Acceptance Form



Client: AirKinetics, Inc.
 Contact: Neal Conroy
 Email: conroyn@airkineticsinc.com
 Phone:

Workorder Number: 1800573
 Date Received: 16-Apr-18 15:55
 Documented by/date: B.Benedict 04/17/2018

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
 mmaier@vista-analytical.com
 916-673-1520

The following information or item is needed to proceed with analysis:

<input type="checkbox"/> Complete Chain-of-Custody	<input type="checkbox"/> Preservative	<input type="checkbox"/> Collector's Name
<input type="checkbox"/> Test Method Requested	<input type="checkbox"/> Sample Identification	<input type="checkbox"/> Sample Type
<input type="checkbox"/> Analyte List Requested	<input type="checkbox"/> Sample Collection Date and/or Time	<input type="checkbox"/> Sample Location
<input type="checkbox"/> Other:		

The following anomalies were noted. Authorization is needed to proceed with analysis.

<input type="checkbox"/> Temperature outside < 6°C Range	Samples Affected: _____		
Temperature _____ °C	Ice Present?	Yes	No
<input type="checkbox"/> Sample ID Discrepancy	<input type="checkbox"/> Insufficient Sample Size		
<input checked="" type="checkbox"/> Sample Holding Time Missed: See Comments	<input type="checkbox"/> Sample Container(s) Broken		
<input type="checkbox"/> Custody Seals Broken	<input type="checkbox"/> Incorrect Container Type		

Comments: Samples out of hold:
 A-MTO9-2
 A-MTO9-3

Client Authorization

Proceed with Analysis: YES NO

Signature and Date

[Signature] 4/18/18

Client Comments/Instructions

Client notified by email 4/18/18

APPENDIX C

SAMPLING METHOD DESCRIPTION AND SCHEMATICS

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EPA Method 1 – Sample and Velocity Traverses for Stationary Sources

For test locations equal to or greater than 12 inches in diameter or 113 inches² in cross sectional area, the number and locations of the sampling and/or traverse points are determined according to the procedures outlined in EPA Method 1. Verification of absence of cyclonic flow testing is conducted prior to testing or documented from historical test data.

EPA Method 2 – Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

For test locations that meet the criteria of EPA Method 1, the flue gas velocity and volumetric flow rate are determined according to the procedures outlined in EPA Method 2. Velocity measurements are made using Type S Pitot tubes conforming to the geometric specifications in the test method. Accordingly, each has been assigned a coefficient of 0.84. Differential pressures are measured with fluid manometers. Effluent gas temperatures are measured with Type K (chromel-alumel) thermocouples equipped with hand-held digital readouts.

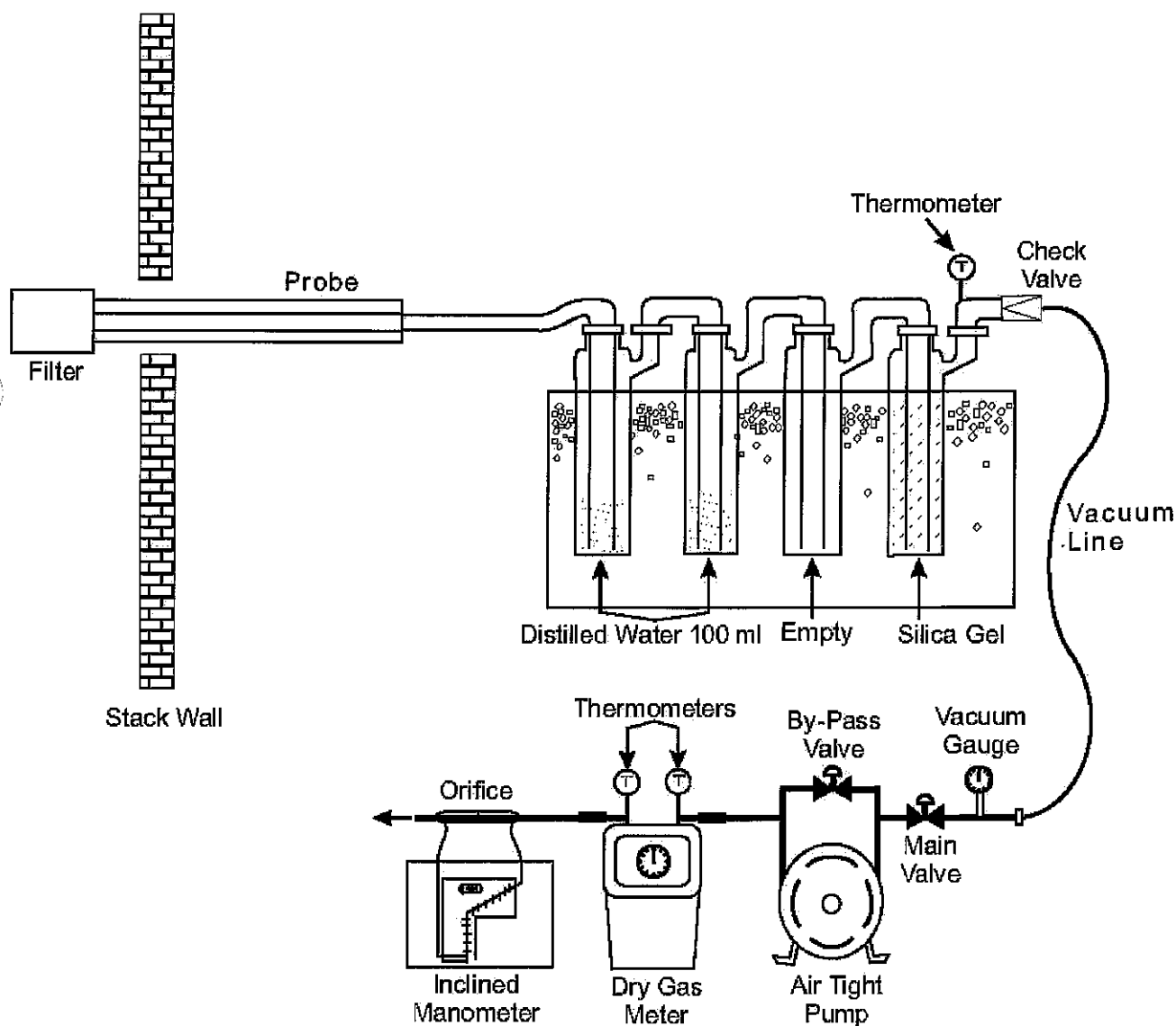
Updated: March 5, 2012

EPA Method 3 – Gas Analysis for the Determination of Molecular Weight

Flue gas analyses for carbon dioxide (CO₂) and oxygen (O₂) and the determination of molecular weight are performed in accordance with EPA Method 3. Single point grab, single point integrated, or multi-point integrated sampling is used to obtain a flue gas sample. A stainless steel probe and a pump are used to fill a sample bag. For molecular weight determination, either an Orsat or a Fyrite analyzer is used for analysis.

The flue gas moisture content is determined according to the sampling and analytical procedures outlined in EPA Method 4. The sampling train consists of a stainless steel or glass tubing probe equipped with a filter, four chilled impingers in series, a pump, a dry gas meter, and a calibrated orifice. The first and second impingers each contain 100 mL of deionized (DI) water, the third impinger is empty, and the fourth contains preweighed silica gel. A sampling train schematic is presented below.

Pre and post test leak checks are performed on the entire sampling train. The sampling points are determined in accordance with EPA Method 1. Sampling is maintained within 10 percent of constant rate. The contents of the impingers are recovered and either volumed or weighed to determine the moisture catch. The silica gel is returned to their original container and weighed to determine the moisture catch.



EPA Method 4 Sampling System

CARB Method 428 - Determination of Polychlorinated Dibenzo-p-dioxin (PCDD), Polychlorinated Dibenzofuran (PCDF), and Polychlorinated Biphenyl Emissions from Stationary Sources

Particulate and gaseous phase PCDD, PCDF and PCB are extracted isokinetically from the stack and collected on XAD-2 resin, in the impingers or in upstream sampling train components. Only the total amounts of each target PCDD, PCDF or PCB analyte in the stack emissions can be determined with this method. Isotopically labelled internal standards are added to all samples in known quantities before matrix-specific extraction of the sample with appropriate organic solvents. If both PCDD/PCDF and PCB are to be determined, it is necessary after extraction to split the sample for two different preliminary fractionation and cleanup procedures. The constituents in each of the processed extracts are separated with high resolution capillary column gas chromatography (HRGC) and identified and measured with low resolution, electron ionization mass spectrometry (LRMS). High resolution mass spectrometry (HRMS) is an alternative method that may be used only for detection of PCDDs and PCDFs.

The sampling train consists of a glass nozzle, a heated glass probe, a heated glass fiber filter, a water-cooled condenser, a XAD sorbent trap, four chilled impingers in series, a pump, a dry gas meter, and a calibrated orifice. The filter is housed in glass filter holder and supported on a Teflon frit. The condenser is placed above the XAD sorbent trap allowing the condensate to drain vertically through the sorbent for removal of the organic constituents in the gas. The sorbent trap is charged with the precleaned resin. The first impinger is empty, the second contains deionized (DI) water, the third is empty, and the fourth contains preweighed silica gel.

Care is taken to ensure that the XAD resin is stored on ice before and after sample collection to prevent resin decomposition.

All glassware (including the sorbent trap glassware) are precleaned prior to sampling according to the procedure listed below.

1. Soak in hot soapy water
2. Rinse three times with tap water
3. Rinse three times with DI water
4. Rinse three times with methanol rinse
5. Rinse three times with toluene
6. Rinse three times with methylene chloride
7. Cap glassware with clean glass plugs or methylene chloride-rinsed aluminum foil.

The entire sample train is leak tested to ensure that leakage does not exceed the lesser of a) 4 percent of the average sampling rate, or b) 0.02 cfm. The probe exit filter compartment temperatures are maintained at $248^{\circ}\text{F} \pm 25^{\circ}\text{F}$ during sampling. Sampling is maintained within ± 10 percent of isokinetics. The temperature of the gas entering the sorbent trap is maintained at or below 60°F .

After sampling the XAD trap is removed, capped, and stored on ice. The filter is removed and placed in a petri dish and sealed with Teflon tape, and stored on ice. The contents of the first three impingers are returned to the original jar, weighed, the weight recorded, and the liquid level marked. The silica gel is returned to the original jar, weighed, and the weight recorded.

The volume of water vapor collected in the impingers and silica gel are summed and entered into the moisture content calculations.

CARB Method 428 - Determination of Polychlorinated Dibenzo-p-dioxin (PCDD), Polychlorinated Dibenzofuran (PCDF), and Polychlorinated Biphenyl Emissions from Stationary Sources Cont.

The front half of the train including the nozzle, probe, and front half of the filter holder is rinsed three times each with methanol, toluene, and methylene chloride into an amber glass jar. The back half of the filter holder and the condenser are rinsed three times each with methanol, toluene, and methylene chloride into an amber glass jar. The first impinger, and connecting glassware are rinsed three times each with methanol, toluene, and methylene chloride into a separate amber glass jar. The second and third impingers are rinsed with DI water three times and the rinse is transferred back to the impinge contents jar. Samples are maintained at 0-4 °C from the time of collection to extraction using ice, coldpacks, and/or refrigeration.

The XAD trap, probe, condenser, filter, impinger contents and rinses are analyzed according to CARB Method 428. The analytical method entails the addition of internal standards in known quantities, matrix-specific extraction of the sample, preliminary fractionating and cleanup of extracts (if necessary) and analysis of the processed extract for analyte.

Sealing greases are not used on the sample train. Recovery of the samples and assembly of the sample trains are conducted in an environment free from uncontrolled dust. A blank train is prepared and consists of a complete sampling train (probe, filter, condenser, XAD trap and impinger set) which is assembled and leak checked in the same manner as a test run. The train is disassembled for recovery using the same procedure used to recover the actual samples. The blank train sample is analyzed along with the sample train ones.

EPA Method TO-9 – Dioxins/Furans for Ambient Sampling

A quartz-fiber filter and glass PUF adsorbent cartridge, precleaned and spiked and provided by the subcontracted analytical laboratory, was installed in the calibrated high-volume air sampler and sampled at a rate to collect 325-400 m³ over 24 hours for each ambient background sample run. After each run was completed, the filter was placed in the original shipping container and the PUF cartridge was wrapped in aluminum foil, identified and shipped to the laboratory for sample processing using proper chain of custody procedures.

Updated: March 5, 2012

APPENDIX D
AETB AND QI CERTIFICATIONS

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American Association for Laboratory Accreditation

Accredited Air Emission Testing Body


A2LA has accredited

AIRKINETICS, INC.
Anaheim, CA

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 31st day of August 31, 2017.




President and CEO
For the Accreditation Council
Certificate Number 3760.01
Valid to October 31, 2019

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

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APPENDIX E

DIOXINS/FURANS RAW ANALYTICAL DATA (CD-ROM)

ATTACHMENT 4

Laboratory Analytical Reports

TABLE 4-1
COMPREHENSIVE VOC AND FIXED GAS SOIL VAPOR ANALYTICAL RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Study	Sample Location	Sample ID	Sample Date	Time	TPH (as Gasoline) ppmv	Acetone ppmv	Benzene ppmv	Benzyl Chloride ppmv	Bromodichloromethane ppmv	Bromoform ppmv	Bromomethane ppmv	2-Butanone ppmv	Carbon Disulfide ppmv	Carbon Tetrachloride ppmv	Chlorobenzene ppmv	Chloroethane ppmv	Chloroform ppmv	Chloromethane ppmv	Dibromochloromethane ppmv
Analytical Method					EPA TO-3M	EPA TO-15M													
Baseline - Shallow	SVE-1A	VSS01351	04/02/18	1035	13,000	40 J	6,800	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
Baseline - Deep	SVE-1B	VSS01350	04/02/18	1028	12,000	51 J	7,600	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
Shallow Zone																			
Shallow Step Test; Step 1	SVE-1A	VSS01355	04/02/18	1255	9,100	34 J	5,400	<2.0	<2.5	<3.2	<5.5	<17	<11	<2.5	<2.7	<9.6	<2.8	<9.6	<2.2
	Influent	VSS01352	04/02/18	1301	170	0.42 J	120	<0.016	<0.020	<0.026	<0.044	<0.14	<0.089	<0.020	<0.022	<0.077	<0.022	<0.077	<0.018
Shallow Step Test; Step 2	SVE-1A	VSS01357	04/02/18	1339	13,000	34 J	7,100	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
	Influent	VSS01360	04/02/18	1353	260	0.22 J	81	<0.0049	<0.0062	<0.0081	<0.014	<0.043	<0.028	<0.0062	<0.0068	<0.024	<0.0069	<0.024	<0.0055
Shallow Step Test; Step 3	SVE-1A	VSS01353	04/02/18	1450	14,000	36 J	7,800	<3.1	<3.9	<5.1	<8.7	<27	<17	<3.9	<4.2	<15	<4.3	<15	<3.4
	Influent	VSS01354	04/02/18	1453	630	<0.72	380	<0.12	<0.15	<0.20	<0.35	<1.1	<0.70	<0.15	<0.17	<0.60	<0.17	<0.60	<0.14
Shallow Step Test; Step 4	SVE-1A				SVE-1A sample not collected as high system vacuum could not be overcome by sample box														
	Influent	VSS01358	04/02/18	1606	1,000	<0.23	580	<0.039	<0.050	<0.065	<0.11	<0.35	<0.22	<0.049	<0.054	<0.19	<0.055	<0.19	<0.044
Shallow Step Test; End	SVE-1A	VSS01359	04/02/18	1707	12,000	<0.029	3,700	<0.0049	<0.0062	<0.0081	<0.014	0.048 J	0.036 J	<0.0062	<0.0068	<0.024	<0.0069	<0.024	<0.0055
	Influent	VSS01356	04/02/18	1701	1,400	<1.1	710	<0.20	<0.25	<0.32	<0.55	<1.7	<1.1	<0.25	<0.27	<0.96	<0.28	<0.96	<0.22
Shallow Constant Rate Test; Initial Hour 1.4	SVE- 1A	VSS01361	04/03/18	916	15,000	12 J	4,200	<0.49	<0.62	<0.81	<1.4	<4.3	<2.8	<0.62	<0.68	<2.4	<0.69	<2.4	<0.55
	Influent	VSS01363	04/03/18	915	890	<0.11	330	<0.020	<0.025	<0.032	<0.055	<0.17	<0.11	<0.025	<0.027	<0.096	<0.028	<0.096	<0.022
	Effluent	VSS01362	04/03/18	918	12	0.021 J	1	<0.00020	<0.00025	<0.00032	<0.00055	<0.0017	<0.0011	<0.00025	<0.00027	<0.00096	<0.00028	<0.00096	<0.00022
Shallow Constant Rate Test; Midpoint Hour 39.4	SVE- 1A	VSS01365	04/05/18	1201	13,000	<23	7,600	<3.9	<5.0	<6.5	<11	<35	<22	<4.9	<5.4	<19	<5.5	<19	<4.4
	Influent	VSS01366	04/05/18	1200	1,700	16 J	980	<0.49	<0.62	<0.81	<1.4	<4.3	<2.8	<0.62	<0.68	<2.4	<0.69	<2.4	<0.55
	Effluent	VSS01367	04/05/18	1205	7	0.042 J	1	<0.0012	<0.0015	<0.0020	<0.0035	<0.011	<0.0070	<0.0015	<0.0017	<0.0060	<0.0017	<0.0060	<0.0014
Shallow Constant Rate Test; Final Hour 66.4	SVE-1A	VSS01368	04/06/18	1455	19,000	<23	7,600	<3.9	<5.0	<6.5	<11	<35	<22	<4.9	<5.4	<19	<5.5	<19	<4.4
	Influent	VSS01369	04/06/18	1500	1,600	31 J	660	<0.49	<0.62	<0.81	<1.4	<4.3	<2.8	<0.62	<0.68	<2.4	<0.69	<2.4	<0.55
	Effluent	VSS01370	04/06/18	1505	8	0.0059 J	1	<0.00098	<0.0012	<0.0016	<0.0028	<0.0086	<0.0056	<0.0012	<0.0014	<0.0048	<0.0014	<0.0048	<0.0011
Deep Zone																			
Deep Step Test; Step 1	SVE-1B	VSS01372	04/09/18	833	17,000	<36	8,700	<6.1	<7.7	<10	<17	<54	<35	<7.7	<8.5	<30	<8.7	<30	<6.8
	Influent	VSS01371	04/09/18	835	5,700	21 J	3,600	<2.0	<2.5	<3.2	<5.5	<17	<11	<2.5	<2.7	<9.6	<2.8	<9.6	<2.2
Deep Step Test; Step 2	SVE-1B	VSS01374	04/09/18	1005	19,000	<46	8,900	<7.8	<9.9	<13	<22	<69	<44	<9.9	<11	<39	<11	<38	<8.8
	Influent	VSS01373	04/09/18	1005	9,400	1.3 J	3,100	<0.039	<0.050	<0.065	<0.11	<0.35	<0.22	<0.049	<0.054	<0.19	<0.055	<0.19	<0.044
Deep Step Test; Step 3	SVE-1B	VSS01376	04/09/18	1220	18,000	48 J	7,700	<7.8	<9.9	<13	<22	<69	<44	<9.9	<11	<39	<11	<38	<8.8
	Influent	VSS01375	04/09/18	1225	12,000	<29	5,700	<4.9	<6.2	<8.1	<14	<43	<28	<6.2	<6.8	<24	<6.9	<24	<5.5
Deep Step Test; Step 4	SVE-1B	VSS01378	04/09/18	1317	19,000	<46	6,900	<7.8	<9.9	<13	<22	<69	<44	<9.9	<11	<39	<11	<38	<8.8
	Influent	VSS01377	04/09/18	1315	11,000	30 J	5,100	<3.9	<5.0	<6.5	<11	<35	<22	<4.9	<5.4	<19	<5.5	<19	<4.4
Deep Step Test; End	SVE-1B	VSS01380	04/09/18	1420	18,000	<46	8,300	<7.8	<9.9	<13	<22	<69	<44	<9.9	<11	<39	<11	<38	<8.8
	Influent	VSS01379	04/09/18	1415	11,000	40 J	4,600	<3.9	<5.0	<6.5	<11	<35	<22	<4.9	<5.4	<19	<5.5	<19	<4.4
Deep Constant Rate Test; Initial Hour 1.5	SVE-1B	VSS01381	04/09/18	1615	17,000	<46	7,900	<7.8	<9.9	<13	<22	<69	<44	<9.9	<11	<39	<11	<38	<8.8
	Influent**	VSS01383	04/09/18	1625	170	0.53 J	33	<0.031	<0.039	<0.051	<0.087	<0.27	<0.17	<0.039	<0.042	<0.15	<0.043	<0.15	<0.034
	Effluent	VSS01382	04/09/18	1620	110	0.35 J	17	<0.020	<0.025	<0.032	<0.055	<0.17	<0.11	<0.025	<0.027	<0.096	<0.028	<0.096	<0.022
Deep Constant Rate Test; Midpoint Hour 32.75	SVE-1B	VSS01384	04/11/18	1028	16,000	<29	7,500	<4.9	<6.2	<8.1	<14	<43	<28	<6.2	<6.8	<24	<6.9	<24	<5.5
	Influent	VSS01385	04/11/18	1025	8,900	14 J	3,900	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
	Effluent*	VSS01386	04/11/18	1030	570	<1.1	81*	<0.20	<0.25	<0.32	<0.55	<1.7	<1.1	<0.25	<0.27	<0.96	<0.28	<0.96	<0.22
Deep Constant Rate Test; Midpoint Hour 56.3	SVE-1B	VSS01387	04/12/18	1000	15,000	<29	7,200	<4.9	<6.2	<8.1	<14	<43	<28	<6.2	<6.8	<24	<6.9	<24	<5.5
	Influent	VSS01388	04/12/18	1000	8,500	18 J	4,100	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
	Effluent*	VSS01389	04/12/18	1005	540	<0.46	64*	<0.078	<0.099	<0.13	<0.22	<0.69	<0.44	<0.099	<0.11	<0.39	<0.11	<0.38	<0.088
Deep Constant Rate Test; Final Hour 82	SVE-1B	VSS01390	04/13/18	1145	15,000	29 J	4,800	<4.9	<6.2	<8.1	<14	<43	<28	<6.2	<6.8	<24	<6.9	<24	<5.5
	Influent	VSS01392	04/13/18	1156	8,900	20 J	2,600	<2.5	<3.1	<4.0	<6.9	<22	<14	<3.1	<3.4	<12	<3.5	<12	<2.7
	Effluent	VSS01391	04/13/18	1151	220	0.36 J	19	<0.020	<0.025	<0.032	<0.055	<0.17	<0.11	<0.025	<0.027	<0.096	<0.028	<0.096	<0.022

Notes:
ppmv = parts per million by volume
%v = percent volume
TPH = total petroleum hydrocarbons
< = not detected above the method detection limit
-- = sample not collected per RD Work Plan Sampling and Analytical Plan (AECOM 2018)
J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
*Elevated due to higher throughput of hydrocarbons for thermal oxidation during deep soil testing and influence from influent concentrations during lab sample collection.
**Initial deep constant rate test system influent vapor sample collected on 4/9 was anomalous as it is not consistent with the SVE-1B well head vapor sample.

TABLE 4-1
COMPREHENSIVE VOC AND FIXED GAS SOIL VAPOR ANALYTICAL RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Study	Sample Location	Sample ID	Sample Date	Time	1,2-Dibromoethane ppmv	1,2-Dichlorobenzene ppmv	1,3-Dichlorobenzene ppmv	1,4-Dichlorobenzene ppmv	Dichlorodifluoromethane ppmv	1,1-Dichloroethane ppmv	1,2-Dichloroethane ppmv	1,1-Dichloroethene ppmv	c-1,2-Dichloroethene ppmv	t-1,2-Dichloroethene ppmv	1,2-Dichloropropane ppmv	c-1,3-Dichloropropane ppmv	t-1,3-Dichloropropane ppmv	Dichlorotetrafluoroethane ppmv	Ethylbenzene ppmv
Analytical Method					EPA TO-15M														
Baseline - Shallow	SVE-1A	VSS01351	04/02/18	1035	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	1700
Baseline - Deep	SVE-1B	VSS01350	04/02/18	1028	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	1900
Shallow Zone																			
Shallow Step Test; Step 1	SVE-1A	VSS01355	04/02/18	1255	<2.8	<2.1	<6.5	<2.7	<2.4	<2.5	<2.7	<8.0	<3.5	<5.1	<7.6	<2.6	<2.8	<11	1700
	Influent	VSS01352	04/02/18	1301	<0.022	<0.017	<0.052	<0.022	<0.019	<0.020	<0.022	<0.064	<0.028	<0.041	<0.061	<0.021	<0.022	<0.085	11
Shallow Step Test; Step 2	SVE-1A	VSS01357	04/02/18	1339	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	2700
	Influent	VSS01360	04/02/18	1353	<0.0069	<0.0053	<0.016	<0.0067	0.015 J	<0.0063	<0.0069	<0.020	<0.0087	<0.013	<0.019	<0.0065	<0.0069	<0.027	9
Shallow Step Test; Step 3	SVE-1A	VSS01353	04/02/18	1450	<4.3	<3.3	<10	<4.2	<3.7	<3.9	<4.3	<12	<5.5	<8.0	<12	<4.1	<4.3	<17	3200
	Influent	VSS01354	04/02/18	1453	<0.17	<0.13	<0.40	<0.17	<0.15	<0.16	<0.17	<0.50	<0.22	<0.32	<0.48	<0.16	<0.17	<0.66	47
Shallow Step Test; Step 4	SVE-1A				SVE-1A sample not collected as high system vacuum could not be overcome by sample box														
	Influent	VSS01358	04/02/18	1606	<0.055	<0.042	<0.13	<0.054	<0.048	<0.050	<0.055	<0.16	<0.070	<0.10	<0.15	<0.052	<0.055	<0.21	180
Shallow Step Test; End	SVE-1A	VSS01359	04/02/18	1707	<0.0069	<0.0053	<0.016	<0.0067	0.015 J	<0.0063	<0.0069	<0.020	<0.0087	<0.013	<0.019	<0.0065	<0.0069	<0.027	930
	Influent	VSS01356	04/02/18	1701	<0.28	<0.21	<0.65	<0.27	<0.24	<0.25	<0.27	<0.80	<0.35	<0.51	<0.76	<0.26	<0.28	<1.1	300
Shallow Constant Rate Test; Initial Hour 1.4	SVE- 1A	VSS01361	04/03/18	916	<0.69	<0.53	<1.6	<0.67	1.5 J	<0.63	<0.69	<2.0	<0.87	<1.3	<1.9	<0.65	<0.69	<2.7	970
	Influent	VSS01363	04/03/18	915	<0.028	<0.021	<0.065	<0.027	<0.024	<0.025	<0.027	<0.080	<0.035	<0.051	<0.076	<0.026	<0.028	<0.11	83
	Effluent	VSS01362	04/03/18	918	<0.00028	<0.00021	<0.00065	<0.00027	<0.00024	<0.00025	<0.00027	<0.00080	<0.00035	<0.00051	<0.00076	<0.00026	<0.00028	<0.0011	1.3
Shallow Constant Rate Test; Midpoint Hour 39.4	SVE- 1A	VSS01365	04/05/18	1201	<5.5	<4.2	<13	<5.4	<4.8	<5.0	<5.5	<16	<7.0	<10	<15	<5.2	<5.5	<21	1900
	Influent	VSS01366	04/05/18	1200	<0.69	<0.53	<1.6	<0.67	<0.60	<0.63	<0.69	<2.0	<0.87	<1.3	<1.9	<0.65	<0.69	<2.7	670
	Effluent	VSS01367	04/05/18	1205	<0.0017	<0.0013	<0.0040	<0.0017	<0.0015	<0.0016	<0.0017	<0.0050	<0.0022	<0.0032	<0.0048	<0.0016	<0.0017	<0.0066	2.2
Shallow Constant Rate Test; Final Hour 66.4	SVE-1A	VSS01368	04/06/18	1455	<5.5	<4.2	<13	<5.4	<4.8	<5.0	<5.5	<16	<7.0	<10	<15	<5.2	<5.5	<21	3000
	Influent	VSS01369	04/06/18	1500	<0.69	<0.53	<1.6	<0.67	<0.60	<0.63	<0.69	<2.0	<0.87	<1.3	<1.9	<0.65	<0.69	<2.7	320
	Effluent	VSS01370	04/06/18	1505	<0.0014	<0.0011	<0.0032	<0.0013	<0.0012	<0.0013	<0.0014	<0.0040	<0.0017	<0.0025	<0.0038	<0.0013	<0.0014	<0.0053	1.6
Deep Zone																			
Deep Step Test; Step 1	SVE-1B	VSS01372	04/09/18	833	<8.6	<6.6	<20	<8.4	<7.4	<7.9	<8.6	<25	<11	<16	<24	<8.2	<8.7	<33	2800
	Influent	VSS01371	04/09/18	835	<2.8	<2.1	<6.5	<2.7	<2.4	<2.5	<2.7	<8.0	<3.5	<5.1	<7.6	<2.6	<2.8	<11	1100
Deep Step Test; Step 2	SVE-1B	VSS01374	04/09/18	1005	<11	<8.5	<26	<11	<9.5	<10	<11	<32	<14	<20	<31	<10	<11	<42	3000
	Influent	VSS01373	04/09/18	1005	<0.055	<0.042	<0.13	<0.054	<0.048	<0.050	<0.055	<0.16	<0.070	<0.10	<0.15	<0.052	<0.055	<0.21	870
Deep Step Test; Step 3	SVE-1B	VSS01376	04/09/18	1220	<11	<8.5	<26	<11	<9.5	<10	<11	<32	<14	<20	<31	<10	<11	<42	2200
	Influent	VSS01375	04/09/18	1225	<6.9	<5.3	<16	<6.7	<6.0	<6.3	<6.9	<20	<8.7	<13	<19	<6.5	<6.9	<27	2700
Deep Step Test; Step 4	SVE-1B	VSS01378	04/09/18	1317	<11	<8.5	<26	<11	<9.5	<10	<11	<32	<14	<20	<31	<10	<11	<42	2700
	Influent	VSS01377	04/09/18	1315	<5.5	<4.2	<13	<5.4	<4.8	<5.0	<5.5	<16	<7.0	<10	<15	<5.2	<5.5	<21	2600
Deep Step Test; End	SVE-1B	VSS01380	04/09/18	1420	<11	<8.5	<26	<11	<9.5	<10	<11	<32	<14	<20	<31	<10	<11	<42	3000
	Influent	VSS01379	04/09/18	1415	<5.5	<4.2	<13	<5.4	<4.8	<5.0	<5.5	<16	<7.0	<10	<15	<5.2	<5.5	<21	2100
Deep Constant Rate Test; Initial Hour 1.5	SVE-1B	VSS01381	04/09/18	1615	<11	<8.5	<26	<11	<9.5	<10	<11	<32	<14	<20	<31	<10	<11	<42	2700
	Influent**	VSS01383	04/09/18	1625	<0.043	<0.033	<0.10	<0.042	<0.037	<0.039	<0.043	<0.12	<0.055	<0.080	<0.12	<0.041	<0.043	<0.17	82
	Effluent	VSS01382	04/09/18	1620	<0.028	<0.021	<0.065	<0.027	<0.024	<0.025	<0.027	<0.080	<0.035	<0.051	<0.076	<0.026	<0.028	<0.11	39
Deep Constant Rate Test; Midpoint Hour 32.75	SVE-1B	VSS01384	04/11/18	1028	<6.9	<5.3	<16	<6.7	<6.0	<6.3	<6.9	<20	<8.7	<13	<19	<6.5	<6.9	<27	4800
	Influent	VSS01385	04/11/18	1025	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	3200
	Effluent*	VSS01386	04/11/18	1030	<0.28	<0.21	<0.65	<0.27	<0.24	<0.25	<0.27	<0.80	<0.35	<0.51	<0.76	<0.26	<0.28	<1.1	310*
Deep Constant Rate Test; Midpoint Hour 56.3	SVE-1B	VSS01387	04/12/18	1000	<6.9	<5.3	<16	<6.7	<6.0	<6.3	<6.9	<20	<8.7	<13	<19	<6.5	<6.9	<27	5900
	Influent	VSS01388	04/12/18	1000	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	3400
	Effluent*	VSS01389	04/12/18	1005	<0.11	<0.085	<0.26	<0.11	<0.095	<0.10	<0.11	<0.32	<0.14	<0.20	<0.31	<0.10	<0.11	<0.42	130*
Deep Constant Rate Test; Final Hour 82	SVE-1B	VSS01390	04/13/18	1145	<6.9	<5.3	<16	<6.7	<6.0	<6.3	<6.9	<20	<8.7	<13	<19	<6.5	<6.9	<27	1900
	Influent	VSS01392	04/13/18	1156	<3.4	<2.7	<8.1	<3.4	<3.0	<3.2	<3.4	<9.9	<4.4	<6.4	<9.5	<3.3	<3.5	<13	1300
	Effluent	VSS01391	04/13/18	1151	<0.028	<0.021	<0.065	<0.027	<0.024	<0.025	<0.027	<0.080	<0.035	<0.051	<0.076	<0.026	<0.028	<0.11	39

Notes:
ppmv = parts per million by volume
%v = percent volume
TPH = total petroleum hydrocarbons
< = not detected above the method detection limit
-- = sample not collected per RD Work Plan Sampling and Analytical Plan (AECOM 2018)
J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
*Elevated due to higher throughput of hydrocarbons for thermal oxidation during deep soil testing and influence from influent concentrations during lab sample collection.
**Initial deep constant rate test system influent vapor sample collected on 4/9 was anomalous as it is not consistent with the SVE-1B well head vapor sample.

TABLE 4-1
COMPREHENSIVE VOC AND FIXED GAS SOIL VAPOR ANALYTICAL RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Study	Sample Location	Sample ID	Sample Date	Time	4-Ethyltoluene ppmv	Hexachloro-1,3-Butadiene ppmv	2-Hexanone ppmv	4-Methyl-2-Pentanone ppmv	Methyl-t-Butyl Ether (MTBE) ppmv	Methylene Chloride ppmv	Styrene ppmv	1,1,2,2-Tetrachloroethane ppmv	Tetrachloroethene ppmv	Toluene ppmv	1,1,2-Trichloro-1,2,2-Trifluoroethane ppmv	1,2,4-Trichlorobenzene ppmv	1,1,1-Trichloroethane ppmv	1,1,2-Trichloroethane ppmv
Analytical Method					EPA TO-15M													
Baseline - Shallow	SVE-1A	VSS01351	04/02/18	1035	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	78 J	<3.5	<6.2	<3.9	<9.1
Baseline - Deep	SVE-1B	VSS01350	04/02/18	1028	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	92 J	<3.5	<6.2	<3.9	<9.1
Shallow Zone																		
Shallow Step Test; Step 1	SVE-1A	VSS01355	04/02/18	1255	<6.4	<4.1	<18	<15	<6.1	<9.9	<2.5	<5.5	<2.7	67 J	<2.8	<5.0	<3.2	<7.3
	Influent	VSS01352	04/02/18	1301	<0.051	<0.033	<0.14	<0.12	<0.049	<0.079	<0.020	<0.044	<0.022	0.90 J	<0.022	<0.040	<0.025	<0.058
Shallow Step Test; Step 2	SVE-1A	VSS01357	04/02/18	1339	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	100 J	<3.5	<6.2	<3.9	<9.1
	Influent	VSS01360	04/02/18	1353	<0.016	<0.010	<0.044	<0.037	<0.015	<0.025	0.0080 J	<0.014	<0.0067	1.3	<0.0070	<0.012	<0.0079	<0.018
Shallow Step Test; Step 3	SVE-1A	VSS01353	04/02/18	1450	<9.9	<6.4	<27	<23	<9.5	<15	<4.0	<8.6	<4.2	110 J	<4.4	<7.8	<4.9	<11
	Influent	VSS01354	04/02/18	1453	<0.40	<0.26	<1.1	<0.93	<0.38	<0.62	<0.16	<0.34	<0.17	3.2 J	<0.18	<0.31	<0.20	<0.46
Shallow Step Test; Step 4	SVE-1A				SVE-1A sample not collected as high system vacuum could not be overcome by sample box													
	Influent	VSS01358	04/02/18	1606	<0.13	<0.082	<0.35	<0.30	<0.12	<0.20	0.092 J	<0.11	<0.054	5.9	<0.056	<0.099	<0.063	<0.15
Shallow Step Test; End	SVE-1A	VSS01359	04/02/18	1707	0.11	<0.010	<0.044	<0.037	<0.015	<0.025	0.77	<0.014	<0.0067	25	<0.0070	<0.012	<0.0079	<0.018
	Influent	VSS01356	04/02/18	1701	<0.64	<0.41	<1.8	<1.5	<0.61	<0.99	<0.25	<0.55	<0.27	10 J	<0.28	<0.50	<0.32	<0.73
Shallow Constant Rate Test; Initial Hour 1.4	SVE- 1A	VSS01361	04/03/18	916	<1.6	<1.0	<4.4	<3.7	<1.5	<2.5	0.94 J	<1.4	<0.67	62	<0.70	<1.2	<0.79	<1.8
	Influent	VSS01363	04/03/18	915	<0.064	<0.041	<0.18	<0.15	<0.061	<0.099	0.11 J	<0.055	<0.027	4.6	<0.028	<0.050	<0.032	<0.073
	Effluent	VSS01362	04/03/18	918	0.00098 J	<0.00041	<0.0018	<0.0015	<0.00061	<0.00099	0.0023 J	<0.00055	<0.00027	0.029	<0.00028	<0.00050	<0.00032	<0.00073
Shallow Constant Rate Test; Midpoint Hour 39.4	SVE- 1A	VSS01365	04/05/18	1201	<13	<8.2	<35	<30	<12	<20	<5.1	<11	<5.4	87 J	<5.6	<9.9	<6.3	<15
	Influent	VSS01366	04/05/18	1200	<1.6	<1.0	<4.4	<3.7	<1.5	<2.5	0.97 J	<1.4	<0.67	20 J	<0.70	<1.2	<0.79	<1.8
	Effluent	VSS01367	04/05/18	1205	<0.0040	<0.0026	<0.011	<0.0093	<0.0038	<0.0062	<0.0016	<0.0034	<0.0017	0.033 J	<0.0018	<0.0031	<0.0020	<0.0046
Shallow Constant Rate Test; Final Hour 66.4	SVE-1A	VSS01368	04/06/18	1455	<13	<8.2	<35	<30	<12	<20	<5.1	<11	<5.4	110 J	<5.6	<9.9	<6.3	<15
	Influent	VSS01369	04/06/18	1500	<1.6	<1.0	<4.4	<3.7	<1.5	<2.5	<0.64	<1.4	<0.67	13 J	<0.70	<1.2	<0.79	<1.8
	Effluent	VSS01370	04/06/18	1505	<0.0032	<0.0020	<0.0088	<0.0074	<0.0031	<0.0050	<0.0013	<0.0028	<0.0013	0.027 J	<0.0014	<0.0025	<0.0016	<0.0036
Deep Zone																		
Deep Step Test; Step 1	SVE-1B	VSS01372	04/09/18	833	<20	<13	<55	<47	<19	<31	<8.0	<17	<8.4	74 J	<8.8	<16	<9.9	<23
	Influent	VSS01371	04/09/18	835	<6.4	<4.1	<18	<15	<6.1	<9.9	<2.5	<5.5	<2.7	39 J	<2.8	<5.0	<3.2	<7.3
Deep Step Test; Step 2	SVE-1B	VSS01374	04/09/18	1005	<25	<16	<70	<60	<24	<40	<10	<22	<11	82 J	<11	<20	<13	<29
	Influent	VSS01373	04/09/18	1005	0.37 J	<0.082	<0.35	<0.30	<0.12	<0.20	0.16 J	<0.11	<0.054	49	<0.056	<0.099	<0.063	<0.15
Deep Step Test; Step 3	SVE-1B	VSS01376	04/09/18	1220	<25	<16	<70	<60	<24	<40	<10	<22	<11	65 J	<11	<20	<13	<29
	Influent	VSS01375	04/09/18	1225	<16	<10	<44	<37	<15	<25	<6.4	<14	<6.7	56 J	<7.0	<12	<7.9	<18
Deep Step Test; Step 4	SVE-1B	VSS01378	04/09/18	1317	<25	<16	<70	<60	<24	<40	<10	<22	<11	60 J	<11	<20	<13	<29
	Influent	VSS01377	04/09/18	1315	<13	<8.2	<35	<30	<12	<20	<5.1	<11	<5.4	55 J	<5.6	<9.9	<6.3	<15
Deep Step Test; End	SVE-1B	VSS01380	04/09/18	1420	<25	<16	<70	<60	<24	<40	<10	<22	<11	70 J	<11	<20	<13	<29
	Influent	VSS01379	04/09/18	1415	<13	<8.2	<35	<30	<12	<20	<5.1	<11	<5.4	44 J	<5.6	<9.9	<6.3	<15
Deep Constant Rate Test; Initial Hour 1.5	SVE-1B	VSS01381	04/09/18	1615	<25	<16	<70	<60	<24	<40	<10	<22	<11	63 J	<11	<20	<13	<29
	Influent**	VSS01383	04/09/18	1625	<0.099	<0.064	<0.27	<0.23	<0.095	<0.15	<0.040	<0.086	<0.042	1.0 J	<0.044	<0.078	<0.049	<0.11
	Effluent	VSS01382	04/09/18	1620	<0.064	<0.041	<0.18	<0.15	<0.061	<0.099	<0.025	<0.055	<0.027	0.53 J	<0.028	<0.050	<0.032	<0.073
Deep Constant Rate Test; Midpoint Hour 32.75	SVE-1B	VSS01384	04/11/18	1028	<16	<10	<44	<37	<15	<25	<6.4	<14	<6.7	85 J	<7.0	<12	<7.9	<18
	Influent	VSS01385	04/11/18	1025	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	50 J	<3.5	<6.2	<3.9	<9.1
	Effluent*	VSS01386	04/11/18	1030	<0.64	<0.41	<1.8	<1.5	<0.61	<0.99	<0.25	<0.55	<0.27	2.4 J	<0.28	<0.50	<0.32	<0.73
Deep Constant Rate Test; Midpoint Hour 56.3	SVE-1B	VSS01387	04/12/18	1000	<16	<10	<44	<37	<15	<25	<6.4	<14	<6.7	87 J	<7.0	<12	<7.9	<18
	Influent	VSS01388	04/12/18	1000	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	54 J	<3.5	<6.2	<3.9	<9.1
	Effluent*	VSS01389	04/12/18	1005	<0.25	<0.16	<0.70	<0.60	<0.24	<0.40	<0.10	<0.22	<0.11	1.7 J	<0.11	<0.20	<0.13	<0.29
Deep Constant Rate Test; Final Hour 82	SVE-1B	VSS01390	04/13/18	1145	<16	<10	<44	<37	<15	<25	<6.4	<14	16 J	43 J	<7.0	<12	<7.9	<18
	Influent	VSS01392	04/13/18	1156	<7.9	<5.1	<22	<19	<7.6	<12	<3.2	<6.9	<3.4	25 J	<3.5	<6.2	<3.9	<9.1
	Effluent	VSS01391	04/13/18	1151	<0.064	<0.041	<0.18	<0.15	<0.061	<0.099	<0.025	<0.055	0.029 J	0.50 J	<0.028	<0.050	<0.032	<0.073

Notes:
ppmv = parts per million by volume
%v = percent volume
TPH = total petroleum hydrocarbons
< = not detected above the method detection limit
-- = sample not collected per RD Work Plan Sampling and Analytical Plan (AECOM 2018)
J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
*Elevated due to higher throughput of hydrocarbons for thermal oxidation during deep soil testing and influence from influent concentrations during lab sample collection.
**Initial deep constant rate test system influent vapor sample collected on 4/9 was anomalous as it is not consistent with the SVE-1B well head vapor sample.

TABLE 4-1
COMPREHENSIVE VOC AND FIXED GAS SOIL VAPOR ANALYTICAL RESULTS
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Study	Sample Location	Sample ID	Sample Date	Time	Trichloroethene ppmv	Trichlorofluoromethane ppmv	1,2,4-Trimethylbenzene ppmv	1,3,5-Trimethylbenzene ppmv	Vinyl Acetate ppmv	Vinyl Chloride ppmv	o-Xylene ppmv	p/m-Xylene ppmv	Methane ppmv	Carbon Dioxide %v	Carbon Monoxide %v	Nitrogen %v	Oxygen (+ Argon) %v
Analytical Method					EPA TO-15M								SCAQMD 25.1M	ASTM D-1946			
Baseline - Shallow	SVE-1A	VSS01351	04/02/18	1035	<3.5	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	290	7.48	<0.183	89.1	3.47
Baseline - Deep	SVE-1B	VSS01350	04/02/18	1028	<3.5	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	360	15.5	<0.183	81.9	2.62
Shallow Zone																	
Shallow Step Test; Step 1	SVE-1A	VSS01355	04/02/18	1255	<2.8	<6.8	<6.1	<5.8	<3.9	<8.9	<6.3	<13	270	5.52	<0.183	87.6	6.91
	Influent	VSS01352	04/02/18	1301	<0.022	<0.055	0.060 J	<0.046	<0.031	<0.071	<0.050	<0.11	9	0.220 J	<0.183	78.9	20.9
Shallow Step Test; Step 2	SVE-1A	VSS01357	04/02/18	1339	<3.5	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	310	6.52	<0.183	89.1	4.33
	Influent	VSS01360	04/02/18	1353	<0.0069	<0.017	<0.015	<0.014	<0.0098	<0.022	<0.016	<0.033	10	0.204 J	<0.183	78.8	21
Shallow Step Test; Step 3	SVE-1A	VSS01353	04/02/18	1450	<4.3	<11	<9.6	<9.1	<6.1	<14	<9.8	<21	320	6.77	<0.183	89.1	4.17
	Influent	VSS01354	04/02/18	1453	<0.17	<0.43	<0.38	<0.36	<0.24	<0.56	<0.39	<0.83	20	0.434 J	<0.183	79.2	20.3
Shallow Step Test; Step 4	SVE-1A				SVE-1A sample not collected as high system vacuum could not be overcome by sample box												
	Influent	VSS01358	04/02/18	1606	<0.056	<0.14	<0.12	<0.12	<0.078	<0.18	<0.13	<0.27	24	0.559	<0.183	79.3	20.1
Shallow Step Test; End	SVE-1A	VSS01359	04/02/18	1707	<0.0069	<0.017	<0.015	<0.014	<0.0098	<0.022	0.17	0.5	300	7.17	<0.183	88.3	4.54
	Influent	VSS01356	04/02/18	1701	<0.28	<0.68	<0.61	<0.58	<0.39	<0.89	<0.63	<1.3	29	0.747	<0.183	79.5	19.7
Shallow Constant Rate Test; Initial Hour 1.4	SVE- 1A	VSS01361	04/03/18	916	<0.69	<1.7	<1.5	<1.4	<0.98	<2.2	<1.6	<3.3	300	8.16	<0.183	88	3.86
	Influent	VSS01363	04/03/18	915	<0.028	<0.068	<0.061	<0.058	<0.039	<0.089	<0.063	<0.13	19	0.506	<0.183	79.1	20.4
	Effluent	VSS01362	04/03/18	918	<0.00028	<0.00068	0.0012 J	<0.00058	<0.00039	<0.00089	0.00098 J	0.0024 J	--	--	--	--	--
Shallow Constant Rate Test; Midpoint Hour 39.4	SVE- 1A	VSS01365	04/05/18	1201	<5.6	<14	<12	<12	<7.8	<18	<13	<27	260	11	<0.183	83.4	5.63
	Influent	VSS01366	04/05/18	1200	<0.69	<1.7	<1.5	<1.4	<0.98	<2.2	<1.6	<3.3	26	1.19	<0.183	79	19.8
	Effluent	VSS01367	04/05/18	1205	<0.0017	<0.0043	<0.0038	<0.0036	<0.0024	<0.0056	<0.0039	<0.0083		--	--	--	--
Shallow Constant Rate Test; Final Hour 66.4	SVE-1A	VSS01368	04/06/18	1455	<5.6	<14	<12	<12	<7.8	<18	<13	<27	250	12.4	<0.183	82.7	4.93
	Influent	VSS01369	04/06/18	1500	<0.69	<1.7	<1.5	<1.4	<0.98	<2.2	<1.6	<3.3	23	1.18	<0.183	78.9	19.9
	Effluent	VSS01370	04/06/18	1505	<0.0014	<0.0034	<0.0031	<0.0029	<0.0020	<0.0044	<0.0031	<0.0067	--	--	--	--	--
Deep Zone																	
Deep Step Test; Step 1	SVE-1B	VSS01372	04/09/18	833	<8.7	<21	<19	<18	<12	<28	<20	<42	290	16.3	<0.183	81.2	2.42
	Influent	VSS01371	04/09/18	835	<2.8	<6.8	<6.1	<5.8	<3.9	<8.9	<6.3	<13	120	6.44	<0.183	79.5	14.1
Deep Step Test; Step 2	SVE-1B	VSS01374	04/09/18	1005	<11	<27	<25	<23	<16	<36	<25	<53	290	16.1	<0.183	81.4	2.55
	Influent	VSS01373	04/09/18	1005	<0.056	<0.14	<0.12	<0.12	<0.078	<0.18	0.20 J	0.38 J	130	7.29	<0.183	79.6	13.1
Deep Step Test; Step 3	SVE-1B	VSS01376	04/09/18	1220	<11	<27	<25	<23	<16	<36	<25	<53	280	15.9	<0.183	81.5	2.53
	Influent	VSS01375	04/09/18	1225	<6.9	<17	<15	<14	<9.8	<22	<16	<33	200	9.86	<0.183	80.2	9.95
Deep Step Test; Step 4	SVE-1B	VSS01378	04/09/18	1317	<11	<27	<25	<23	<16	<36	<25	<53	350	15.8	<0.183	81.6	2.61
	Influent	VSS01377	04/09/18	1315	<5.6	<14	<12	<12	<7.8	<18	<13	<27	170	8.66	<0.183	79.9	11.4
Deep Step Test; End	SVE-1B	VSS01380	04/09/18	1420	<11	<27	<25	<23	<16	<36	<25	<53	330	16	<0.183	81.4	2.61
	Influent	VSS01379	04/09/18	1415	<5.6	<14	<12	<12	<7.8	<18	<13	<27	130	8.34	<0.183	79.8	11.8
Deep Constant Rate Test; Initial Hour 1.5	SVE-1B	VSS01381	04/09/18	1615	<11	<27	<25	<23	<16	<36	<25	<53	250	15.9	<0.183	81.1	3.04
	Influent**	VSS01383	04/09/18	1625	<0.043	<0.11	<0.096	<0.091	<0.061	<0.14	<0.098	<0.21	--	--	--	--	--
	Effluent	VSS01382	04/09/18	1620	<0.028	<0.068	<0.061	<0.058	<0.039	<0.089	<0.063	<0.13	0.82 J	<0.139	<0.183	78.5	21.4
Deep Constant Rate Test; Midpoint Hour 32.75	SVE-1B	VSS01384	04/11/18	1028	<6.9	<17	<15	<14	<9.8	<22	<16	<33	270	14.9	<0.183	78.8	6.29
	Influent	VSS01385	04/11/18	1025	9.3 J	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	130	7.48	<0.183	78.6	14
	Effluent*	VSS01386	04/11/18	1030	<0.28	<0.68	<0.61	<0.58	<0.39	<0.89	<0.63	<1.3	--	--	--	--	--
Deep Constant Rate Test; Midpoint Hour 56.3	SVE-1B	VSS01387	04/12/18	1000	<6.9	<17	<15	<14	<9.8	<22	<16	<33	140	14.4	<0.183	78	7.55
	Influent	VSS01388	04/12/18	1000	4.0 J	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	76	7.62	<0.183	78.2	14.2
	Effluent*	VSS01389	04/12/18	1005	0.11 J	<0.27	<0.25	<0.23	<0.16	<0.36	<0.25	<0.53	--	--	--	--	--
Deep Constant Rate Test; Final Hour 82	SVE-1B	VSS01390	04/13/18	1145	<6.9	<17	<15	<14	<9.8	<22	<16	<33	82	13.8	<0.183	77.8	8.4
	Influent	VSS01392	04/13/18	1156	<3.5	<8.5	<7.7	<7.2	<4.9	<11	<7.8	<17	45	7.09	<0.183	78.1	14.8
	Effluent	VSS01391	04/13/18	1151	<0.028	<0.068	<0.061	<0.058	<0.039	<0.089	<0.063	<0.13	--	--	--	--	--

Notes:
ppmv = parts per million by volume
%v = percent volume
TPH = total petroleum hydrocarbons
< = not detected above the method detection limit
-- = sample not collected per RD Work Plan Sampling and Analytical Plan (AECOM 2018)
J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
*Elevated due to higher throughput of hydrocarbons for thermal oxidation during deep soil testing and influence from influent concentrations during lab sample collection.
**Initial deep constant rate test system influent vapor sample collected on 4/9 was anomalous as it is not consistent with the SVE-1B well head vapor sample.



Supplemental Report 1

The original report has been revised/corrected.

**WORK ORDER NUMBER: 18-04-0188***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** AECOM**Client Project Name:** Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601**Attention:** Julie Doane-Allmon
130 Robin Hill Road
Suite 100
Santa Barbara, CA 93117-3153*Vikas Patel*Approved for release on 04/18/2018 by:
Vikas Patel
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
 Work Order Number: 18-04-0188

1	Work Order Narrative.	3
2	Sample Summary.	4
3	QC Association Summary.	5
4	Detections Summary.	7
5	Client Sample Data.	12
	5.1 ASTM D-1946 Fixed Gases (Air).	12
	5.2 EPA TO-15 (M) Full List (Air).	16
	5.3 EPA TO-3 (M) TPH Gasoline (Air).	51
	5.4 SCAQMD 25.1 TGNMO and CH4 (Air).	54
6	Quality Control Sample Data.	57
	6.1 Sample Duplicate.	57
	6.2 LCS/LCSD.	58
7	Sample Analysis Summary.	78
8	Glossary of Terms and Qualifiers.	79
9	Chain-of-Custody/Sample Receipt Form.	80

Work Order Narrative

Work Order: 18-04-0188

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/03/18. They were assigned to Work Order 18-04-0188.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



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Sample Summary

Client: AECOM	Work Order: 18-04-0188
130 Robin Hill Road, Suite 100	Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Santa Barbara, CA 93117-3153	PO Number: 100067
	Date/Time Received: 04/03/18 17:45
	Number of Containers: 15

Attn: Julie Doane-Allmon

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VSS01361	18-04-0188-1	04/03/18 09:24	2	Air
VSS01362	18-04-0188-2	04/03/18 09:18	1	Air
VSS01363	18-04-0188-3	04/03/18 09:15	1	Air
VSS01360	18-04-0188-4	04/02/18 13:35	1	Air
VSS01358	18-04-0188-5	04/02/18 16:06	1	Air
VSS01359	18-04-0188-6	04/02/18 17:07	1	Air
VSS01357	18-04-0188-7	04/02/18 13:39	1	Air
VSS01356	18-04-0188-8	04/02/18 17:01	1	Air
VSS01355	18-04-0188-9	04/02/18 12:55	1	Air
VSS01354	18-04-0188-10	04/02/18 14:53	1	Air
VSS01353	18-04-0188-11	04/02/18 14:50	1	Air
VSS01352	18-04-0188-12	04/02/18 13:01	1	Air
VSS01351	18-04-0188-13	04/02/18 10:35	1	Air
VSS01350	18-04-0188-14	04/02/18 10:28	1	Air


[Return to Contents](#)



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QC Association Summary

Work Order: 18-04-0188

Page 1 of 2

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01361	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180403L01
VSS01361	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01361	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01361	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01361	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180403L01
VSS01362	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01362	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180403L02
VSS01362	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01363	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180403L01
VSS01363	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01363	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01363	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01363	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180403L01
VSS01360	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180403L01
VSS01360	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01360	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01360	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01360	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01360	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180403L01
VSS01358	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180403L01
VSS01358	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01358	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01358	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01358	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180403L01
VSS01359	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180403L01
VSS01359	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180403L02
VSS01359	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180404L02
VSS01359	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180403L02
VSS01359	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01359	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180403L01
VSS01357	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01357	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01357	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180405L02
VSS01357	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01357	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01356	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01356	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01356	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180405L02
VSS01356	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01356	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01355	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01355	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01355	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180405L02

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun

Return to Contents

QC Association Summary

Work Order: 18-04-0188

Page 2 of 2

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01355	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01355	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01354	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01354	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01354	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180405L02
VSS01354	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01354	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01353	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01353	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01353	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180405L02
VSS01353	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01353	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01352	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01352	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01352	EPA TO-15 (M) Full List	R	N/A	GC/MS HH	*1	180405L02
VSS01352	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01352	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01351	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01351	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01351	EPA TO-15 (M) Full List	R	N/A	GC/MS HH	*1	180405L02
VSS01351	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01351	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01
VSS01350	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180404L01
VSS01350	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180404L02
VSS01350	EPA TO-15 (M) Full List	R	N/A	GC/MS HH	*1	180405L02
VSS01350	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180403D02	180403L02
VSS01350	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180404L01



Return to Contents

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0188
Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Received: 04/03/18

Attn: Julie Doane-Allmon

Page 1 of 5

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01361 (18-04-0188-1)						
Carbon Dioxide	8.16		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	3.86		0.500	%v	ASTM D-1946	N/A
Nitrogen	88.0		0.500	%v	ASTM D-1946	N/A
Acetone	12	J	2.9*	ppm (v/v)	EPA TO-15M	N/A
Benzene	4200		40	ppm (v/v)	EPA TO-15M	N/A
Dichlorodifluoromethane	1.5	J	0.60*	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	970		5.0	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.94	J	0.64*	ppm (v/v)	EPA TO-15M	N/A
Toluene	62		50	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	15000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	300		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01362 (18-04-0188-2)						
Acetone	0.021	J	0.0011*	ppm (v/v)	EPA TO-15M	N/A
Benzene	0.77		0.010	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1.3		0.010	ppm (v/v)	EPA TO-15M	N/A
4-Ethyltoluene	0.00098	J	0.00064*	ppm (v/v)	EPA TO-15M	N/A
o-Xylene	0.00098	J	0.00063*	ppm (v/v)	EPA TO-15M	N/A
p/m-Xylene	0.0024	J	0.0013*	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.0023	J	0.00025*	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.029		0.020	ppm (v/v)	EPA TO-15M	N/A
1,2,4-Trimethylbenzene	0.0012	J	0.00061*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	12		1.5	ppm (v/v)	EPA TO-3M	N/A
VSS01363 (18-04-0188-3)						
Carbon Dioxide	0.506		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	20.4		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.1		0.500	%v	ASTM D-1946	N/A
Benzene	330		5.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	83		5.0	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.11	J	0.025*	ppm (v/v)	EPA TO-15M	N/A
Toluene	4.6		2.0	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	890		3.8	ppm (v/v)	EPA TO-3M	N/A
Methane	19		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0188
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/03/18

Attn: Julie Doane-Allmon

Page 2 of 5

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01360 (18-04-0188-4)						
Carbon Dioxide	0.204	J	0.139*	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	21.0		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.8		0.500	%v	ASTM D-1946	N/A
Acetone	0.22	J	0.029*	ppm (v/v)	EPA TO-15M	N/A
Benzene	81		1.0	ppm (v/v)	EPA TO-15M	N/A
Dichlorodifluoromethane	0.015	J	0.0060*	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	9.0		0.50	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.0080	J	0.0064*	ppm (v/v)	EPA TO-15M	N/A
Toluene	1.3		0.50	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	260		1.5	ppm (v/v)	EPA TO-3M	N/A
Methane	10		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01358 (18-04-0188-5)						
Carbon Dioxide	0.559		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	20.1		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.3		0.500	%v	ASTM D-1946	N/A
Benzene	580		5.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	180		5.0	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.092	J	0.051*	ppm (v/v)	EPA TO-15M	N/A
Toluene	5.9		4.0	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	1000		7.5	ppm (v/v)	EPA TO-3M	N/A
Methane	24		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01359 (18-04-0188-6)						
Carbon Dioxide	7.17		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	4.54		0.500	%v	ASTM D-1946	N/A
Nitrogen	88.3		0.500	%v	ASTM D-1946	N/A
Benzene	3700		100	ppm (v/v)	EPA TO-15M	N/A
2-Butanone	0.048	J	0.043*	ppm (v/v)	EPA TO-15M	N/A
Carbon Disulfide	0.036	J	0.028*	ppm (v/v)	EPA TO-15M	N/A
Dichlorodifluoromethane	0.015	J	0.0060*	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	930		100	ppm (v/v)	EPA TO-15M	N/A
4-Ethyltoluene	0.11		0.050	ppm (v/v)	EPA TO-15M	N/A
o-Xylene	0.17		0.050	ppm (v/v)	EPA TO-15M	N/A
p/m-Xylene	0.50		0.20	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.77		0.15	ppm (v/v)	EPA TO-15M	N/A
Toluene	25		10	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	12000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	300		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0188
Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Received: 04/03/18

Attn: Julie Doane-Allmon

Page 3 of 5

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01357 (18-04-0188-7)						
Carbon Dioxide	6.52		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	4.33		0.500	%v	ASTM D-1946	N/A
Nitrogen	89.1		0.500	%v	ASTM D-1946	N/A
Acetone	34	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	7100		100	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2700		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	100	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	13000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	310		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01356 (18-04-0188-8)						
Carbon Dioxide	0.747		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	19.7		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.5		0.500	%v	ASTM D-1946	N/A
Benzene	710		10	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	300		2.0	ppm (v/v)	EPA TO-15M	N/A
Toluene	10	J	0.54*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	1400		7.5	ppm (v/v)	EPA TO-3M	N/A
Methane	29		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01355 (18-04-0188-9)						
Carbon Dioxide	5.52		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	6.91		0.500	%v	ASTM D-1946	N/A
Nitrogen	87.6		0.500	%v	ASTM D-1946	N/A
Acetone	34	J	11*	ppm (v/v)	EPA TO-15M	N/A
Benzene	5400		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1700		20	ppm (v/v)	EPA TO-15M	N/A
Toluene	67	J	5.4*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	9100		75	ppm (v/v)	EPA TO-3M	N/A
Methane	270		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01354 (18-04-0188-10)						
Carbon Dioxide	0.434	J	0.139*	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	20.3		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.2		0.500	%v	ASTM D-1946	N/A
Benzene	380		5.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	47		1.2	ppm (v/v)	EPA TO-15M	N/A
Toluene	3.2	J	0.34*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	630		3.8	ppm (v/v)	EPA TO-3M	N/A
Methane	20		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0188
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/03/18

Attn: Julie Doane-Allmon

Page 4 of 5

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01353 (18-04-0188-11)						
Carbon Dioxide	6.77		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	4.17		0.500	%v	ASTM D-1946	N/A
Nitrogen	89.1		0.500	%v	ASTM D-1946	N/A
Acetone	36	J	18*	ppm (v/v)	EPA TO-15M	N/A
Benzene	7800		120	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3200		31	ppm (v/v)	EPA TO-15M	N/A
Toluene	110	J	8.4*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	14000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	320		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01352 (18-04-0188-12)						
Carbon Dioxide	0.220	J	0.139*	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	20.9		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.9		0.500	%v	ASTM D-1946	N/A
Acetone	0.42	J	0.092*	ppm (v/v)	EPA TO-15M	N/A
Benzene	120		1.2	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	11		0.16	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.90	J	0.043*	ppm (v/v)	EPA TO-15M	N/A
1,2,4-Trimethylbenzene	0.060	J	0.049*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	170		1.5	ppm (v/v)	EPA TO-3M	N/A
Methane	9.0		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01351 (18-04-0188-13)						
Carbon Dioxide	7.48		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	3.47		0.500	%v	ASTM D-1946	N/A
Nitrogen	89.1		0.500	%v	ASTM D-1946	N/A
Acetone	40	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	6800		100	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1700		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	78	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	13000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	290		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0188
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/03/18

Attn: Julie Doane-Allmon

Page 5 of 5

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01350 (18-04-0188-14)						
Carbon Dioxide	15.5		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.62		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.9		0.500	%v	ASTM D-1946	N/A
Acetone	51	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	7600		100	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1900		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	92	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	12000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	360		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

Subcontracted analyses, if any, are not included in this summary.

Return to Contents

* MDL is shown



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01361	18-04-0188-1-A	04/03/18 09:24	Air	GC 65	N/A	04/03/18 19:25	180403L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	8.16	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	3.86	0.500	0.205	1.00	
Nitrogen	88.0	0.500	0.477	1.00	

VSS01363	18-04-0188-3-A	04/03/18 09:15	Air	GC 65	N/A	04/03/18 20:09	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.506	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	20.4	0.500	0.205	1.00	
Nitrogen	79.1	0.500	0.477	1.00	

VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC 65	N/A	04/03/18 20:28	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.204	0.500	0.139	1.00	J
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	21.0	0.500	0.205	1.00	
Nitrogen	78.8	0.500	0.477	1.00	

VSS01358	18-04-0188-5-A	04/02/18 16:06	Air	GC 65	N/A	04/03/18 20:52	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.559	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	20.1	0.500	0.205	1.00	
Nitrogen	79.3	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC 65	N/A	04/03/18 21:14	180403L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.17	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	4.54	0.500	0.205	1.00	
Nitrogen	88.3	0.500	0.477	1.00	

VSS01357	18-04-0188-7-A	04/02/18 13:39	Air	GC 65	N/A	04/04/18 12:01	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	6.52	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	4.33	0.500	0.205	1.00	
Nitrogen	89.1	0.500	0.477	1.00	

VSS01356	18-04-0188-8-A	04/02/18 17:01	Air	GC 65	N/A	04/04/18 12:20	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.747	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	19.7	0.500	0.205	1.00	
Nitrogen	79.5	0.500	0.477	1.00	

VSS01355	18-04-0188-9-A	04/02/18 12:55	Air	GC 65	N/A	04/04/18 12:50	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	5.52	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	6.91	0.500	0.205	1.00	
Nitrogen	87.6	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01354	18-04-0188-10-A	04/02/18 14:53	Air	GC 65	N/A	04/04/18 13:08	180404L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.434	0.500	0.139	1.00	J
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	20.3	0.500	0.205	1.00	
Nitrogen	79.2	0.500	0.477	1.00	

VSS01353	18-04-0188-11-A	04/02/18 14:50	Air	GC 65	N/A	04/04/18 13:26	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	6.77	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	4.17	0.500	0.205	1.00	
Nitrogen	89.1	0.500	0.477	1.00	

VSS01352	18-04-0188-12-A	04/02/18 13:01	Air	GC 65	N/A	04/04/18 13:45	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	0.220	0.500	0.139	1.00	J
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	20.9	0.500	0.205	1.00	
Nitrogen	78.9	0.500	0.477	1.00	

VSS01351	18-04-0188-13-A	04/02/18 10:35	Air	GC 65	N/A	04/04/18 14:05	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.48	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	3.47	0.500	0.205	1.00	
Nitrogen	89.1	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01350	18-04-0188-14-A	04/02/18 10:28	Air	GC 65	N/A	04/04/18 14:28	180404L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	15.5	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.62	0.500	0.205	1.00	
Nitrogen	81.9	0.500	0.477	1.00	

Method Blank	099-16-444-760	N/A	Air	GC 65	N/A	04/03/18 10:34	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

Method Blank	099-16-444-761	N/A	Air	GC 65	N/A	04/04/18 11:17	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01361	18-04-0188-1-A	04/03/18 09:24	Air	GC/MS II	N/A	04/03/18 22:41	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	12	500	2.9	10000	J
Benzyl Chloride	ND	15	0.49	10000	
Bromodichloromethane	ND	5.0	0.62	10000	
Bromoform	ND	5.0	0.81	10000	
Bromomethane	ND	5.0	1.4	10000	
2-Butanone	ND	15	4.3	10000	
Carbon Disulfide	ND	100	2.8	10000	
Carbon Tetrachloride	ND	5.0	0.62	10000	
Chlorobenzene	ND	5.0	0.68	10000	
Chloroethane	ND	5.0	2.4	10000	
Chloroform	ND	5.0	0.69	10000	
Chloromethane	ND	5.0	2.4	10000	
Dibromochloromethane	ND	5.0	0.55	10000	
Dichlorodifluoromethane	1.5	5.0	0.60	10000	J
1,1-Dichloroethane	ND	5.0	0.63	10000	
1,1-Dichloroethene	ND	5.0	2.0	10000	
1,2-Dibromoethane	ND	5.0	0.69	10000	
Dichlorotetrafluoroethane	ND	20	2.7	10000	
1,2-Dichlorobenzene	ND	5.0	0.53	10000	
1,2-Dichloroethane	ND	5.0	0.69	10000	
1,2-Dichloropropane	ND	5.0	1.9	10000	
1,3-Dichlorobenzene	ND	5.0	1.6	10000	
1,4-Dichlorobenzene	ND	5.0	0.67	10000	
c-1,3-Dichloropropene	ND	5.0	0.65	10000	
c-1,2-Dichloroethene	ND	5.0	0.87	10000	
t-1,2-Dichloroethene	ND	5.0	1.3	10000	
t-1,3-Dichloropropene	ND	10	0.69	10000	
Ethylbenzene	970	5.0	1.4	10000	
4-Ethyltoluene	ND	5.0	1.6	10000	
Hexachloro-1,3-Butadiene	ND	15	1.0	10000	
2-Hexanone	ND	15	4.4	10000	
Methyl-t-Butyl Ether (MTBE)	ND	20	1.5	10000	
Methylene Chloride	ND	50	2.5	10000	
4-Methyl-2-Pentanone	ND	15	3.7	10000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	5.0	1.6	10000	
p/m-Xylene	ND	20	3.3	10000	
Styrene	0.94	15	0.64	10000	J
Tetrachloroethene	ND	5.0	0.67	10000	
Toluene	62	50	1.3	10000	
Trichloroethene	ND	5.0	0.69	10000	
Trichlorofluoromethane	ND	10	1.7	10000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	15	0.70	10000	
1,1,1-Trichloroethane	ND	5.0	0.79	10000	
1,1,2-Trichloroethane	ND	5.0	1.8	10000	
1,3,5-Trimethylbenzene	ND	5.0	1.4	10000	
1,1,2,2-Tetrachloroethane	ND	10	1.4	10000	
1,2,4-Trimethylbenzene	ND	15	1.5	10000	
1,2,4-Trichlorobenzene	ND	20	1.2	10000	
Vinyl Acetate	ND	20	0.98	10000	
Vinyl Chloride	ND	5.0	2.2	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	93	47-137	
Toluene-d8	102	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01361	18-04-0188-1-A	04/03/18 09:24	Air	GC/MS II	N/A	04/04/18 19:48	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	4200	40	6.8	80000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	95	47-137	
Toluene-d8	101	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01362	18-04-0188-2-A	04/03/18 09:18	Air	GC/MS II	N/A	04/03/18 21:02	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.021	0.20	0.0011	4.00	J
Benzyl Chloride	ND	0.0060	0.00020	4.00	
Bromodichloromethane	ND	0.0020	0.00025	4.00	
Bromoform	ND	0.0020	0.00032	4.00	
Bromomethane	ND	0.0020	0.00055	4.00	
2-Butanone	ND	0.0060	0.0017	4.00	
Carbon Disulfide	ND	0.040	0.0011	4.00	
Carbon Tetrachloride	ND	0.0020	0.00025	4.00	
Chlorobenzene	ND	0.0020	0.00027	4.00	
Chloroethane	ND	0.0020	0.00096	4.00	
Chloroform	ND	0.0020	0.00028	4.00	
Chloromethane	ND	0.0020	0.00096	4.00	
Dibromochloromethane	ND	0.0020	0.00022	4.00	
Dichlorodifluoromethane	ND	0.0020	0.00024	4.00	
1,1-Dichloroethane	ND	0.0020	0.00025	4.00	
1,1-Dichloroethene	ND	0.0020	0.00080	4.00	
1,2-Dibromoethane	ND	0.0020	0.00028	4.00	
Dichlorotetrafluoroethane	ND	0.0080	0.0011	4.00	
1,2-Dichlorobenzene	ND	0.0020	0.00021	4.00	
1,2-Dichloroethane	ND	0.0020	0.00027	4.00	
1,2-Dichloropropane	ND	0.0020	0.00076	4.00	
1,3-Dichlorobenzene	ND	0.0020	0.00065	4.00	
1,4-Dichlorobenzene	ND	0.0020	0.00027	4.00	
c-1,3-Dichloropropene	ND	0.0020	0.00026	4.00	
c-1,2-Dichloroethene	ND	0.0020	0.00035	4.00	
t-1,2-Dichloroethene	ND	0.0020	0.00051	4.00	
t-1,3-Dichloropropene	ND	0.0040	0.00028	4.00	
4-Ethyltoluene	0.00098	0.0020	0.00064	4.00	J
Hexachloro-1,3-Butadiene	ND	0.0060	0.00041	4.00	
2-Hexanone	ND	0.0060	0.0018	4.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0080	0.00061	4.00	
Methylene Chloride	ND	0.020	0.00099	4.00	
4-Methyl-2-Pentanone	ND	0.0060	0.0015	4.00	
o-Xylene	0.00098	0.0020	0.00063	4.00	J

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 35

Parameter	Result	RL	MDL	DF	Qualifiers
p/m-Xylene	0.0024	0.0080	0.0013	4.00	J
Styrene	0.0023	0.0060	0.00025	4.00	J
Tetrachloroethene	ND	0.0020	0.00027	4.00	
Toluene	0.029	0.020	0.00054	4.00	
Trichloroethene	ND	0.0020	0.00028	4.00	
Trichlorofluoromethane	ND	0.0040	0.00068	4.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0060	0.00028	4.00	
1,1,1-Trichloroethane	ND	0.0020	0.00032	4.00	
1,1,2-Trichloroethane	ND	0.0020	0.00073	4.00	
1,3,5-Trimethylbenzene	ND	0.0020	0.00058	4.00	
1,1,2,2-Tetrachloroethane	ND	0.0040	0.00055	4.00	
1,2,4-Trimethylbenzene	0.0012	0.0060	0.00061	4.00	J
1,2,4-Trichlorobenzene	ND	0.0080	0.00050	4.00	
Vinyl Acetate	ND	0.0080	0.00039	4.00	
Vinyl Chloride	ND	0.0020	0.00089	4.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	92	47-137	
Toluene-d8	102	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01362	18-04-0188-2-A	04/03/18 09:18	Air	GC/MS II	N/A	04/03/18 21:51	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.77	0.010	0.0017	20.0	
Ethylbenzene	1.3	0.010	0.0029	20.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	95	57-129	
1,2-Dichloroethane-d4	95	47-137	
Toluene-d8	106	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01363	18-04-0188-3-A	04/03/18 09:15	Air	GC/MS II	N/A	04/03/18 23:30	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	20	0.11	400	
Benzyl Chloride	ND	0.60	0.020	400	
Bromodichloromethane	ND	0.20	0.025	400	
Bromoform	ND	0.20	0.032	400	
Bromomethane	ND	0.20	0.055	400	
2-Butanone	ND	0.60	0.17	400	
Carbon Disulfide	ND	4.0	0.11	400	
Carbon Tetrachloride	ND	0.20	0.025	400	
Chlorobenzene	ND	0.20	0.027	400	
Chloroethane	ND	0.20	0.096	400	
Chloroform	ND	0.20	0.028	400	
Chloromethane	ND	0.20	0.096	400	
Dibromochloromethane	ND	0.20	0.022	400	
Dichlorodifluoromethane	ND	0.20	0.024	400	
1,1-Dichloroethane	ND	0.20	0.025	400	
1,1-Dichloroethene	ND	0.20	0.080	400	
1,2-Dibromoethane	ND	0.20	0.028	400	
Dichlorotetrafluoroethane	ND	0.80	0.11	400	
1,2-Dichlorobenzene	ND	0.20	0.021	400	
1,2-Dichloroethane	ND	0.20	0.027	400	
1,2-Dichloropropane	ND	0.20	0.076	400	
1,3-Dichlorobenzene	ND	0.20	0.065	400	
1,4-Dichlorobenzene	ND	0.20	0.027	400	
c-1,3-Dichloropropene	ND	0.20	0.026	400	
c-1,2-Dichloroethene	ND	0.20	0.035	400	
t-1,2-Dichloroethene	ND	0.20	0.051	400	
t-1,3-Dichloropropene	ND	0.40	0.028	400	
4-Ethyltoluene	ND	0.20	0.064	400	
Hexachloro-1,3-Butadiene	ND	0.60	0.041	400	
2-Hexanone	ND	0.60	0.18	400	
Methyl-t-Butyl Ether (MTBE)	ND	0.80	0.061	400	
Methylene Chloride	ND	2.0	0.099	400	
4-Methyl-2-Pentanone	ND	0.60	0.15	400	
o-Xylene	ND	0.20	0.063	400	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
p/m-Xylene	ND	0.80	0.13	400	
Styrene	0.11	0.60	0.025	400	J
Tetrachloroethene	ND	0.20	0.027	400	
Toluene	4.6	2.0	0.054	400	
Trichloroethene	ND	0.20	0.028	400	
Trichlorofluoromethane	ND	0.40	0.068	400	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.60	0.028	400	
1,1,1-Trichloroethane	ND	0.20	0.032	400	
1,1,2-Trichloroethane	ND	0.20	0.073	400	
1,3,5-Trimethylbenzene	ND	0.20	0.058	400	
1,1,2,2-Tetrachloroethane	ND	0.40	0.055	400	
1,2,4-Trimethylbenzene	ND	0.60	0.061	400	
1,2,4-Trichlorobenzene	ND	0.80	0.050	400	
Vinyl Acetate	ND	0.80	0.039	400	
Vinyl Chloride	ND	0.20	0.089	400	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	95	47-137	
Toluene-d8	104	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01363	18-04-0188-3-A	04/03/18 09:15	Air	GC/MS II	N/A	04/04/18 20:39	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	330	5.0	0.85	10000	
Ethylbenzene	83	5.0	1.4	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	96	47-137	
Toluene-d8	101	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC/MS II	N/A	04/04/18 00:22	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.22	5.0	0.029	100	J
Benzyl Chloride	ND	0.15	0.0049	100	
Bromodichloromethane	ND	0.050	0.0062	100	
Bromoform	ND	0.050	0.0081	100	
Bromomethane	ND	0.050	0.014	100	
2-Butanone	ND	0.15	0.043	100	
Carbon Disulfide	ND	1.0	0.028	100	
Carbon Tetrachloride	ND	0.050	0.0062	100	
Chlorobenzene	ND	0.050	0.0068	100	
Chloroethane	ND	0.050	0.024	100	
Chloroform	ND	0.050	0.0069	100	
Chloromethane	ND	0.050	0.024	100	
Dibromochloromethane	ND	0.050	0.0055	100	
Dichlorodifluoromethane	0.015	0.050	0.0060	100	J
1,1-Dichloroethane	ND	0.050	0.0063	100	
1,1-Dichloroethene	ND	0.050	0.020	100	
1,2-Dibromoethane	ND	0.050	0.0069	100	
Dichlorotetrafluoroethane	ND	0.20	0.027	100	
1,2-Dichlorobenzene	ND	0.050	0.0053	100	
1,2-Dichloroethane	ND	0.050	0.0069	100	
1,2-Dichloropropane	ND	0.050	0.019	100	
1,3-Dichlorobenzene	ND	0.050	0.016	100	
1,4-Dichlorobenzene	ND	0.050	0.0067	100	
c-1,3-Dichloropropene	ND	0.050	0.0065	100	
c-1,2-Dichloroethene	ND	0.050	0.0087	100	
t-1,2-Dichloroethene	ND	0.050	0.013	100	
t-1,3-Dichloropropene	ND	0.10	0.0069	100	
4-Ethyltoluene	ND	0.050	0.016	100	
Hexachloro-1,3-Butadiene	ND	0.15	0.010	100	
2-Hexanone	ND	0.15	0.044	100	
Methyl-t-Butyl Ether (MTBE)	ND	0.20	0.015	100	
Methylene Chloride	ND	0.50	0.025	100	
4-Methyl-2-Pentanone	ND	0.15	0.037	100	
o-Xylene	ND	0.050	0.016	100	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 35

Parameter	Result	RL	MDL	DF	Qualifiers
p/m-Xylene	ND	0.20	0.033	100	
Styrene	0.0080	0.15	0.0064	100	J
Tetrachloroethene	ND	0.050	0.0067	100	
Toluene	1.3	0.50	0.013	100	
Trichloroethene	ND	0.050	0.0069	100	
Trichlorofluoromethane	ND	0.10	0.017	100	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.15	0.0070	100	
1,1,1-Trichloroethane	ND	0.050	0.0079	100	
1,1,2-Trichloroethane	ND	0.050	0.018	100	
1,3,5-Trimethylbenzene	ND	0.050	0.014	100	
1,1,2,2-Tetrachloroethane	ND	0.10	0.014	100	
1,2,4-Trimethylbenzene	ND	0.15	0.015	100	
1,2,4-Trichlorobenzene	ND	0.20	0.012	100	
Vinyl Acetate	ND	0.20	0.0098	100	
Vinyl Chloride	ND	0.050	0.022	100	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	103	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC/MS II	N/A	04/04/18 17:21	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Ethylbenzene	9.0	0.50	0.14	1000	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	92	47-137	
Toluene-d8	104	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC/MS II	N/A	04/04/18 18:10	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	81	1.0	0.17	2000	
Surrogate	Rec. (%)	Control Limits	Qualifiers		
1,4-Bromofluorobenzene	98	57-129			
1,2-Dichloroethane-d4	93	47-137			
Toluene-d8	99	78-156			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 10 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01358	18-04-0188-5-A	04/02/18 16:06	Air	GC/MS II	N/A	04/04/18 01:11	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	40	0.23	800	
Benzyl Chloride	ND	1.2	0.039	800	
Bromodichloromethane	ND	0.40	0.050	800	
Bromoform	ND	0.40	0.065	800	
Bromomethane	ND	0.40	0.11	800	
2-Butanone	ND	1.2	0.35	800	
Carbon Disulfide	ND	8.0	0.22	800	
Carbon Tetrachloride	ND	0.40	0.049	800	
Chlorobenzene	ND	0.40	0.054	800	
Chloroethane	ND	0.40	0.19	800	
Chloroform	ND	0.40	0.055	800	
Chloromethane	ND	0.40	0.19	800	
Dibromochloromethane	ND	0.40	0.044	800	
Dichlorodifluoromethane	ND	0.40	0.048	800	
1,1-Dichloroethane	ND	0.40	0.050	800	
1,1-Dichloroethene	ND	0.40	0.16	800	
1,2-Dibromoethane	ND	0.40	0.055	800	
Dichlorotetrafluoroethane	ND	1.6	0.21	800	
1,2-Dichlorobenzene	ND	0.40	0.042	800	
1,2-Dichloroethane	ND	0.40	0.055	800	
1,2-Dichloropropane	ND	0.40	0.15	800	
1,3-Dichlorobenzene	ND	0.40	0.13	800	
1,4-Dichlorobenzene	ND	0.40	0.054	800	
c-1,3-Dichloropropene	ND	0.40	0.052	800	
c-1,2-Dichloroethene	ND	0.40	0.070	800	
t-1,2-Dichloroethene	ND	0.40	0.10	800	
t-1,3-Dichloropropene	ND	0.80	0.055	800	
4-Ethyltoluene	ND	0.40	0.13	800	
Hexachloro-1,3-Butadiene	ND	1.2	0.082	800	
2-Hexanone	ND	1.2	0.35	800	
Methyl-t-Butyl Ether (MTBE)	ND	1.6	0.12	800	
Methylene Chloride	ND	4.0	0.20	800	
4-Methyl-2-Pentanone	ND	1.2	0.30	800	
o-Xylene	ND	0.40	0.13	800	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 11 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
p/m-Xylene	ND	1.6	0.27	800	
Styrene	0.092	1.2	0.051	800	J
Tetrachloroethene	ND	0.40	0.054	800	
Toluene	5.9	4.0	0.11	800	
Trichloroethene	ND	0.40	0.056	800	
Trichlorofluoromethane	ND	0.80	0.14	800	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	1.2	0.056	800	
1,1,1-Trichloroethane	ND	0.40	0.063	800	
1,1,2-Trichloroethane	ND	0.40	0.15	800	
1,3,5-Trimethylbenzene	ND	0.40	0.12	800	
1,1,2,2-Tetrachloroethane	ND	0.80	0.11	800	
1,2,4-Trimethylbenzene	ND	1.2	0.12	800	
1,2,4-Trichlorobenzene	ND	1.6	0.099	800	
Vinyl Acetate	ND	1.6	0.078	800	
Vinyl Chloride	ND	0.40	0.18	800	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	104	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01358	18-04-0188-5-A	04/02/18 16:06	Air	GC/MS II	N/A	04/04/18 19:00	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	580	5.0	0.85	10000	
Ethylbenzene	180	5.0	1.4	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	101	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 12 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC/MS II	N/A	04/04/18 02:48	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	5.0	0.029	100	
Benzyl Chloride	ND	0.15	0.0049	100	
Bromodichloromethane	ND	0.050	0.0062	100	
Bromoform	ND	0.050	0.0081	100	
Bromomethane	ND	0.050	0.014	100	
2-Butanone	0.048	0.15	0.043	100	J
Carbon Disulfide	0.036	1.0	0.028	100	J
Carbon Tetrachloride	ND	0.050	0.0062	100	
Chlorobenzene	ND	0.050	0.0068	100	
Chloroethane	ND	0.050	0.024	100	
Chloroform	ND	0.050	0.0069	100	
Chloromethane	ND	0.050	0.024	100	
Dibromochloromethane	ND	0.050	0.0055	100	
Dichlorodifluoromethane	0.015	0.050	0.0060	100	J
1,1-Dichloroethane	ND	0.050	0.0063	100	
1,1-Dichloroethene	ND	0.050	0.020	100	
1,2-Dibromoethane	ND	0.050	0.0069	100	
Dichlorotetrafluoroethane	ND	0.20	0.027	100	
1,2-Dichlorobenzene	ND	0.050	0.0053	100	
1,2-Dichloroethane	ND	0.050	0.0069	100	
1,2-Dichloropropane	ND	0.050	0.019	100	
1,3-Dichlorobenzene	ND	0.050	0.016	100	
1,4-Dichlorobenzene	ND	0.050	0.0067	100	
c-1,3-Dichloropropene	ND	0.050	0.0065	100	
c-1,2-Dichloroethene	ND	0.050	0.0087	100	
t-1,2-Dichloroethene	ND	0.050	0.013	100	
t-1,3-Dichloropropene	ND	0.10	0.0069	100	
4-Ethyltoluene	0.11	0.050	0.016	100	
Hexachloro-1,3-Butadiene	ND	0.15	0.010	100	
2-Hexanone	ND	0.15	0.044	100	
Methyl-t-Butyl Ether (MTBE)	ND	0.20	0.015	100	
Methylene Chloride	ND	0.50	0.025	100	
4-Methyl-2-Pentanone	ND	0.15	0.037	100	
o-Xylene	0.17	0.050	0.016	100	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 13 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
p/m-Xylene	0.50	0.20	0.033	100	
Styrene	0.77	0.15	0.0064	100	
Tetrachloroethene	ND	0.050	0.0067	100	
Trichloroethene	ND	0.050	0.0069	100	
Trichlorofluoromethane	ND	0.10	0.017	100	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.15	0.0070	100	
1,1,1-Trichloroethane	ND	0.050	0.0079	100	
1,1,2-Trichloroethane	ND	0.050	0.018	100	
1,3,5-Trimethylbenzene	ND	0.050	0.014	100	
1,1,2,2-Tetrachloroethane	ND	0.10	0.014	100	
1,2,4-Trimethylbenzene	ND	0.15	0.015	100	
1,2,4-Trichlorobenzene	ND	0.20	0.012	100	
Vinyl Acetate	ND	0.20	0.0098	100	
Vinyl Chloride	ND	0.050	0.022	100	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	103	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	112	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC/MS II	N/A	04/04/18 23:16	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Toluene	25	10	0.27	2000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	97	47-137	
Toluene-d8	103	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 14 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC/MS II	N/A	04/04/18 01:58	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	3700	100	17	200000	
Ethylbenzene	930	100	29	200000	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	100	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 15 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01357	18-04-0188-7-A	04/02/18 13:39	Air	GC/MS ZZ	N/A	04/04/18 23:44	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	34	2500	14	50000	J
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	2700	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	
4-Methyl-2-Pentanone	ND	75	19	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 16 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	100	250	6.7	50000	J
Trichloroethene	ND	25	3.5	50000	
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01357	18-04-0188-7-A	04/02/18 13:39	Air	GC/MS ZZ	N/A	04/05/18 15:15	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	7100	100	17	200000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	96	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 17 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01356	18-04-0188-8-A	04/02/18 17:01	Air	GC/MS ZZ	N/A	04/05/18 00:28	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	200	1.1	4000	
Benzyl Chloride	ND	6.0	0.20	4000	
Bromodichloromethane	ND	2.0	0.25	4000	
Bromoform	ND	2.0	0.32	4000	
Bromomethane	ND	2.0	0.55	4000	
2-Butanone	ND	6.0	1.7	4000	
Carbon Disulfide	ND	40	1.1	4000	
Carbon Tetrachloride	ND	2.0	0.25	4000	
Chlorobenzene	ND	2.0	0.27	4000	
Chloroethane	ND	2.0	0.96	4000	
Chloroform	ND	2.0	0.28	4000	
Chloromethane	ND	2.0	0.96	4000	
Dibromochloromethane	ND	2.0	0.22	4000	
Dichlorodifluoromethane	ND	2.0	0.24	4000	
1,1-Dichloroethane	ND	2.0	0.25	4000	
1,1-Dichloroethene	ND	2.0	0.80	4000	
1,2-Dibromoethane	ND	2.0	0.28	4000	
Dichlorotetrafluoroethane	ND	8.0	1.1	4000	
1,2-Dichlorobenzene	ND	2.0	0.21	4000	
1,2-Dichloroethane	ND	2.0	0.27	4000	
1,2-Dichloropropane	ND	2.0	0.76	4000	
1,3-Dichlorobenzene	ND	2.0	0.65	4000	
1,4-Dichlorobenzene	ND	2.0	0.27	4000	
c-1,3-Dichloropropene	ND	2.0	0.26	4000	
c-1,2-Dichloroethene	ND	2.0	0.35	4000	
t-1,2-Dichloroethene	ND	2.0	0.51	4000	
t-1,3-Dichloropropene	ND	4.0	0.28	4000	
Ethylbenzene	300	2.0	0.58	4000	
4-Ethyltoluene	ND	2.0	0.64	4000	
Hexachloro-1,3-Butadiene	ND	6.0	0.41	4000	
2-Hexanone	ND	6.0	1.8	4000	
Methyl-t-Butyl Ether (MTBE)	ND	8.0	0.61	4000	
Methylene Chloride	ND	20	0.99	4000	
4-Methyl-2-Pentanone	ND	6.0	1.5	4000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 18 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	2.0	0.63	4000	
p/m-Xylene	ND	8.0	1.3	4000	
Styrene	ND	6.0	0.25	4000	
Tetrachloroethene	ND	2.0	0.27	4000	
Toluene	10	20	0.54	4000	J
Trichloroethene	ND	2.0	0.28	4000	
Trichlorofluoromethane	ND	4.0	0.68	4000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	6.0	0.28	4000	
1,1,1-Trichloroethane	ND	2.0	0.32	4000	
1,1,2-Trichloroethane	ND	2.0	0.73	4000	
1,3,5-Trimethylbenzene	ND	2.0	0.58	4000	
1,1,2,2-Tetrachloroethane	ND	4.0	0.55	4000	
1,2,4-Trimethylbenzene	ND	6.0	0.61	4000	
1,2,4-Trichlorobenzene	ND	8.0	0.50	4000	
Vinyl Acetate	ND	8.0	0.39	4000	
Vinyl Chloride	ND	2.0	0.89	4000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	100	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01356	18-04-0188-8-A	04/02/18 17:01	Air	GC/MS ZZ	N/A	04/05/18 16:00	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	710	10	1.7	20000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	95	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 19 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01355	18-04-0188-9-A	04/02/18 12:55	Air	GC/MS ZZ	N/A	04/05/18 01:12	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	34	2000	11	40000	J
Benzyl Chloride	ND	60	2.0	40000	
Bromodichloromethane	ND	20	2.5	40000	
Bromoform	ND	20	3.2	40000	
Bromomethane	ND	20	5.5	40000	
2-Butanone	ND	60	17	40000	
Carbon Disulfide	ND	400	11	40000	
Carbon Tetrachloride	ND	20	2.5	40000	
Chlorobenzene	ND	20	2.7	40000	
Chloroethane	ND	20	9.6	40000	
Chloroform	ND	20	2.8	40000	
Chloromethane	ND	20	9.6	40000	
Dibromochloromethane	ND	20	2.2	40000	
Dichlorodifluoromethane	ND	20	2.4	40000	
1,1-Dichloroethane	ND	20	2.5	40000	
1,1-Dichloroethene	ND	20	8.0	40000	
1,2-Dibromoethane	ND	20	2.8	40000	
Dichlorotetrafluoroethane	ND	80	11	40000	
1,2-Dichlorobenzene	ND	20	2.1	40000	
1,2-Dichloroethane	ND	20	2.7	40000	
1,2-Dichloropropane	ND	20	7.6	40000	
1,3-Dichlorobenzene	ND	20	6.5	40000	
1,4-Dichlorobenzene	ND	20	2.7	40000	
c-1,3-Dichloropropene	ND	20	2.6	40000	
c-1,2-Dichloroethene	ND	20	3.5	40000	
t-1,2-Dichloroethene	ND	20	5.1	40000	
t-1,3-Dichloropropene	ND	40	2.8	40000	
Ethylbenzene	1700	20	5.8	40000	
4-Ethyltoluene	ND	20	6.4	40000	
Hexachloro-1,3-Butadiene	ND	60	4.1	40000	
2-Hexanone	ND	60	18	40000	
Methyl-t-Butyl Ether (MTBE)	ND	80	6.1	40000	
Methylene Chloride	ND	200	9.9	40000	
4-Methyl-2-Pentanone	ND	60	15	40000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 20 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	20	6.3	40000	
p/m-Xylene	ND	80	13	40000	
Styrene	ND	60	2.5	40000	
Tetrachloroethene	ND	20	2.7	40000	
Toluene	67	200	5.4	40000	J
Trichloroethene	ND	20	2.8	40000	
Trichlorofluoromethane	ND	40	6.8	40000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	60	2.8	40000	
1,1,1-Trichloroethane	ND	20	3.2	40000	
1,1,2-Trichloroethane	ND	20	7.3	40000	
1,3,5-Trimethylbenzene	ND	20	5.8	40000	
1,1,2,2-Tetrachloroethane	ND	40	5.5	40000	
1,2,4-Trimethylbenzene	ND	60	6.1	40000	
1,2,4-Trichlorobenzene	ND	80	5.0	40000	
Vinyl Acetate	ND	80	3.9	40000	
Vinyl Chloride	ND	20	8.9	40000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	103	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01355	18-04-0188-9-A	04/02/18 12:55	Air	GC/MS ZZ	N/A	04/05/18 16:44	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	5400	80	14	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	94	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 21 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01354	18-04-0188-10-A	04/02/18 14:53	Air	GC/MS ZZ	N/A	04/05/18 01:57	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	120	0.72	2500	
Benzyl Chloride	ND	3.8	0.12	2500	
Bromodichloromethane	ND	1.2	0.15	2500	
Bromoform	ND	1.2	0.20	2500	
Bromomethane	ND	1.2	0.35	2500	
2-Butanone	ND	3.8	1.1	2500	
Carbon Disulfide	ND	25	0.70	2500	
Carbon Tetrachloride	ND	1.2	0.15	2500	
Chlorobenzene	ND	1.2	0.17	2500	
Chloroethane	ND	1.2	0.60	2500	
Chloroform	ND	1.2	0.17	2500	
Chloromethane	ND	1.2	0.60	2500	
Dibromochloromethane	ND	1.2	0.14	2500	
Dichlorodifluoromethane	ND	1.2	0.15	2500	
1,1-Dichloroethane	ND	1.2	0.16	2500	
1,1-Dichloroethene	ND	1.2	0.50	2500	
1,2-Dibromoethane	ND	1.2	0.17	2500	
Dichlorotetrafluoroethane	ND	5.0	0.66	2500	
1,2-Dichlorobenzene	ND	1.2	0.13	2500	
1,2-Dichloroethane	ND	1.2	0.17	2500	
1,2-Dichloropropane	ND	1.2	0.48	2500	
1,3-Dichlorobenzene	ND	1.2	0.40	2500	
1,4-Dichlorobenzene	ND	1.2	0.17	2500	
c-1,3-Dichloropropene	ND	1.2	0.16	2500	
c-1,2-Dichloroethene	ND	1.2	0.22	2500	
t-1,2-Dichloroethene	ND	1.2	0.32	2500	
t-1,3-Dichloropropene	ND	2.5	0.17	2500	
Ethylbenzene	47	1.2	0.36	2500	
4-Ethyltoluene	ND	1.2	0.40	2500	
Hexachloro-1,3-Butadiene	ND	3.8	0.26	2500	
2-Hexanone	ND	3.8	1.1	2500	
Methyl-t-Butyl Ether (MTBE)	ND	5.0	0.38	2500	
Methylene Chloride	ND	12	0.62	2500	
4-Methyl-2-Pentanone	ND	3.8	0.93	2500	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 22 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	1.2	0.39	2500	
p/m-Xylene	ND	5.0	0.83	2500	
Styrene	ND	3.8	0.16	2500	
Tetrachloroethene	ND	1.2	0.17	2500	
Toluene	3.2	12	0.34	2500	J
Trichloroethene	ND	1.2	0.17	2500	
Trichlorofluoromethane	ND	2.5	0.43	2500	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	3.8	0.18	2500	
1,1,1-Trichloroethane	ND	1.2	0.20	2500	
1,1,2-Trichloroethane	ND	1.2	0.46	2500	
1,3,5-Trimethylbenzene	ND	1.2	0.36	2500	
1,1,2,2-Tetrachloroethane	ND	2.5	0.34	2500	
1,2,4-Trimethylbenzene	ND	3.8	0.38	2500	
1,2,4-Trichlorobenzene	ND	5.0	0.31	2500	
Vinyl Acetate	ND	5.0	0.24	2500	
Vinyl Chloride	ND	1.2	0.56	2500	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	104	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01354	18-04-0188-10-A	04/02/18 14:53	Air	GC/MS ZZ	N/A	04/05/18 17:33	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	380	5.0	0.85	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	110	57-129	
1,2-Dichloroethane-d4	103	47-137	
Toluene-d8	97	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 23 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01353	18-04-0188-11-A	04/02/18 14:50	Air	GC/MS ZZ	N/A	04/05/18 02:41	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	36	3100	18	62500	J
Benzyl Chloride	ND	94	3.1	62500	
Bromodichloromethane	ND	31	3.9	62500	
Bromoform	ND	31	5.1	62500	
Bromomethane	ND	31	8.7	62500	
2-Butanone	ND	94	27	62500	
Carbon Disulfide	ND	620	17	62500	
Carbon Tetrachloride	ND	31	3.9	62500	
Chlorobenzene	ND	31	4.2	62500	
Chloroethane	ND	31	15	62500	
Chloroform	ND	31	4.3	62500	
Chloromethane	ND	31	15	62500	
Dibromochloromethane	ND	31	3.4	62500	
Dichlorodifluoromethane	ND	31	3.7	62500	
1,1-Dichloroethane	ND	31	3.9	62500	
1,1-Dichloroethene	ND	31	12	62500	
1,2-Dibromoethane	ND	31	4.3	62500	
Dichlorotetrafluoroethane	ND	120	17	62500	
1,2-Dichlorobenzene	ND	31	3.3	62500	
1,2-Dichloroethane	ND	31	4.3	62500	
1,2-Dichloropropane	ND	31	12	62500	
1,3-Dichlorobenzene	ND	31	10	62500	
1,4-Dichlorobenzene	ND	31	4.2	62500	
c-1,3-Dichloropropene	ND	31	4.1	62500	
c-1,2-Dichloroethene	ND	31	5.5	62500	
t-1,2-Dichloroethene	ND	31	8.0	62500	
t-1,3-Dichloropropene	ND	62	4.3	62500	
Ethylbenzene	3200	31	9.1	62500	
4-Ethyltoluene	ND	31	9.9	62500	
Hexachloro-1,3-Butadiene	ND	94	6.4	62500	
2-Hexanone	ND	94	27	62500	
Methyl-t-Butyl Ether (MTBE)	ND	120	9.5	62500	
Methylene Chloride	ND	310	15	62500	
4-Methyl-2-Pentanone	ND	94	23	62500	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 24 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	31	9.8	62500	
p/m-Xylene	ND	120	21	62500	
Styrene	ND	94	4.0	62500	
Tetrachloroethene	ND	31	4.2	62500	
Toluene	110	310	8.4	62500	J
Trichloroethene	ND	31	4.3	62500	
Trichlorofluoromethane	ND	62	11	62500	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	94	4.4	62500	
1,1,1-Trichloroethane	ND	31	4.9	62500	
1,1,2-Trichloroethane	ND	31	11	62500	
1,3,5-Trimethylbenzene	ND	31	9.1	62500	
1,1,2,2-Tetrachloroethane	ND	62	8.6	62500	
1,2,4-Trimethylbenzene	ND	94	9.6	62500	
1,2,4-Trichlorobenzene	ND	120	7.8	62500	
Vinyl Acetate	ND	120	6.1	62500	
Vinyl Chloride	ND	31	14	62500	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	104	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01353	18-04-0188-11-A	04/02/18 14:50	Air	GC/MS ZZ	N/A	04/05/18 18:17	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	7800	120	21	250000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	96	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 25 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01352	18-04-0188-12-A	04/02/18 13:01	Air	GC/MS ZZ	N/A	04/05/18 04:10	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.42	16	0.092	320	J
Benzyl Chloride	ND	0.48	0.016	320	
Bromodichloromethane	ND	0.16	0.020	320	
Bromoform	ND	0.16	0.026	320	
Bromomethane	ND	0.16	0.044	320	
2-Butanone	ND	0.48	0.14	320	
Carbon Disulfide	ND	3.2	0.089	320	
Carbon Tetrachloride	ND	0.16	0.020	320	
Chlorobenzene	ND	0.16	0.022	320	
Chloroethane	ND	0.16	0.077	320	
Chloroform	ND	0.16	0.022	320	
Chloromethane	ND	0.16	0.077	320	
Dibromochloromethane	ND	0.16	0.018	320	
Dichlorodifluoromethane	ND	0.16	0.019	320	
1,1-Dichloroethane	ND	0.16	0.020	320	
1,1-Dichloroethene	ND	0.16	0.064	320	
1,2-Dibromoethane	ND	0.16	0.022	320	
Dichlorotetrafluoroethane	ND	0.64	0.085	320	
1,2-Dichlorobenzene	ND	0.16	0.017	320	
1,2-Dichloroethane	ND	0.16	0.022	320	
1,2-Dichloropropane	ND	0.16	0.061	320	
1,3-Dichlorobenzene	ND	0.16	0.052	320	
1,4-Dichlorobenzene	ND	0.16	0.022	320	
c-1,3-Dichloropropene	ND	0.16	0.021	320	
c-1,2-Dichloroethene	ND	0.16	0.028	320	
t-1,2-Dichloroethene	ND	0.16	0.041	320	
t-1,3-Dichloropropene	ND	0.32	0.022	320	
Ethylbenzene	11	0.16	0.046	320	
4-Ethyltoluene	ND	0.16	0.051	320	
Hexachloro-1,3-Butadiene	ND	0.48	0.033	320	
2-Hexanone	ND	0.48	0.14	320	
Methyl-t-Butyl Ether (MTBE)	ND	0.64	0.049	320	
Methylene Chloride	ND	1.6	0.079	320	
4-Methyl-2-Pentanone	ND	0.48	0.12	320	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 26 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	0.16	0.050	320	
p/m-Xylene	ND	0.64	0.11	320	
Styrene	ND	0.48	0.020	320	
Tetrachloroethene	ND	0.16	0.022	320	
Toluene	0.90	1.6	0.043	320	J
Trichloroethene	ND	0.16	0.022	320	
Trichlorofluoromethane	ND	0.32	0.055	320	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.48	0.022	320	
1,1,1-Trichloroethane	ND	0.16	0.025	320	
1,1,2-Trichloroethane	ND	0.16	0.058	320	
1,3,5-Trimethylbenzene	ND	0.16	0.046	320	
1,1,2,2-Tetrachloroethane	ND	0.32	0.044	320	
1,2,4-Trimethylbenzene	0.060	0.48	0.049	320	J
1,2,4-Trichlorobenzene	ND	0.64	0.040	320	
Vinyl Acetate	ND	0.64	0.031	320	
Vinyl Chloride	ND	0.16	0.071	320	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	99	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01352	18-04-0188-12-A	04/02/18 13:01	Air	GC/MS HH	N/A	04/05/18 15:57	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	120	1.2	0.21	2500	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	111	57-129	
1,2-Dichloroethane-d4	92	47-137	
Toluene-d8	98	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 27 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01351	18-04-0188-13-A	04/02/18 10:35	Air	GC/MS ZZ	N/A	04/05/18 04:53	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	40	2500	14	50000	J
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	1700	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	
4-Methyl-2-Pentanone	ND	75	19	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 28 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	78	250	6.7	50000	J
Trichloroethene	ND	25	3.5	50000	
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	98	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01351	18-04-0188-13-A	04/02/18 10:35	Air	GC/MS HH	N/A	04/05/18 16:47	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	6800	100	17	200000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	114	57-129	
1,2-Dichloroethane-d4	95	47-137	
Toluene-d8	98	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 29 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01350	18-04-0188-14-A	04/02/18 10:28	Air	GC/MS ZZ	N/A	04/05/18 05:37	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	51	2500	14	50000	J
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	1900	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	
4-Methyl-2-Pentanone	ND	75	19	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 30 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	92	250	6.7	50000	J
Trichloroethene	ND	25	3.5	50000	
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	99	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01350	18-04-0188-14-A	04/02/18 10:28	Air	GC/MS HH	N/A	04/05/18 17:36	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	7600	100	17	200000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	116	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	96	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 31 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8420	N/A	Air	GC/MS II	N/A	04/03/18 13:45	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 32 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	94	57-129	
1,2-Dichloroethane-d4	88	47-137	
Toluene-d8	98	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
Method Blank	099-12-981-8423	N/A	Air	GC/MS II	N/A	04/04/18 14:11	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	ND	0.00050	0.000085	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
Toluene	ND	0.0050	0.00013	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	96	57-129	
1,2-Dichloroethane-d4	88	47-137	
Toluene-d8	97	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 33 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8422	N/A	Air	GC/MS ZZ	N/A	04/04/18 14:17	180404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 34 of 35

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	96	47-137	
Toluene-d8	97	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8425	N/A	Air	GC/MS HH	N/A	04/05/18 15:07	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	ND	0.00050	0.000085	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	94	47-137	
Toluene-d8	97	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 35 of 35

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8426	N/A	Air	GC/MS ZZ	N/A	04/05/18 14:29	180405L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	ND	0.00050	0.000085	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	97	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01361	18-04-0188-1-A	04/03/18 09:24	Air	GC 13	N/A	04/03/18 19:34	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	15000	75	21	50.0	

VSS01362	18-04-0188-2-A	04/03/18 09:18	Air	GC 13	N/A	04/03/18 19:48	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	12	1.5	0.43	1.00	

VSS01363	18-04-0188-3-A	04/03/18 09:15	Air	GC 13	N/A	04/03/18 20:13	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	890	3.8	1.1	2.50	

VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC 13	N/A	04/03/18 20:25	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	260	1.5	0.43	1.00	

VSS01358	18-04-0188-5-A	04/02/18 16:06	Air	GC 13	N/A	04/03/18 20:54	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	1000	7.5	2.1	5.00	

VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC 13	N/A	04/03/18 21:20	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	12000	75	21	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01357	18-04-0188-7-A	04/02/18 13:39	Air	GC 13	N/A	04/04/18 09:10	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	13000	75	21	50.0	

VSS01356	18-04-0188-8-A	04/02/18 17:01	Air	GC 13	N/A	04/04/18 09:57	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	1400	7.5	2.1	5.00	

VSS01355	18-04-0188-9-A	04/02/18 12:55	Air	GC 13	N/A	04/04/18 10:40	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	9100	75	21	50.0	

VSS01354	18-04-0188-10-A	04/02/18 14:53	Air	GC 13	N/A	04/04/18 11:10	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	630	3.8	1.1	2.50	

VSS01353	18-04-0188-11-A	04/02/18 14:50	Air	GC 13	N/A	04/04/18 11:47	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	14000	75	21	50.0	

VSS01352	18-04-0188-12-A	04/02/18 13:01	Air	GC 13	N/A	04/04/18 12:02	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	170	1.5	0.43	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01351	18-04-0188-13-A	04/02/18 10:35	Air	GC 13	N/A	04/04/18 12:30	180403L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	13000	75	21	50.0	

VSS01350	18-04-0188-14-A	04/02/18 10:28	Air	GC 13	N/A	04/04/18 12:43	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	12000	75	21	50.0	

Method Blank	098-01-005-8393	N/A	Air	GC 13	N/A	04/03/18 19:11	180403L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	ND	1.5	0.43	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01361	18-04-0188-1-A	04/03/18 09:24	Air	GC 14	N/A	04/03/18 19:09	180403L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	300	1.0	0.21	1.00	

VSS01363	18-04-0188-3-A	04/03/18 09:15	Air	GC 14	N/A	04/03/18 19:55	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	19	1.0	0.21	1.00	

VSS01360	18-04-0188-4-A	04/02/18 13:35	Air	GC 14	N/A	04/03/18 20:15	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	10	1.0	0.21	1.00	

VSS01358	18-04-0188-5-A	04/02/18 16:06	Air	GC 14	N/A	04/03/18 20:35	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	24	1.0	0.21	1.00	

VSS01359	18-04-0188-6-A	04/02/18 17:07	Air	GC 14	N/A	04/03/18 20:56	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	300	1.0	0.21	1.00	

VSS01357	18-04-0188-7-A	04/02/18 13:39	Air	GC 14	N/A	04/04/18 12:16	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	310	1.0	0.21	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01356	18-04-0188-8-A	04/02/18 17:01	Air	GC 14	N/A	04/04/18 13:11	180404L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	29	1.0	0.21	1.00	

VSS01355	18-04-0188-9-A	04/02/18 12:55	Air	GC 14	N/A	04/04/18 13:39	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	270	1.0	0.21	1.00	

VSS01354	18-04-0188-10-A	04/02/18 14:53	Air	GC 14	N/A	04/04/18 14:56	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	20	1.0	0.21	1.00	

VSS01353	18-04-0188-11-A	04/02/18 14:50	Air	GC 14	N/A	04/04/18 15:45	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	320	1.0	0.21	1.00	

VSS01352	18-04-0188-12-A	04/02/18 13:01	Air	GC 14	N/A	04/04/18 16:27	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	9.0	1.0	0.21	1.00	

VSS01351	18-04-0188-13-A	04/02/18 10:35	Air	GC 14	N/A	04/04/18 16:59	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	290	1.0	0.21	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01350	18-04-0188-14-A	04/02/18 10:28	Air	GC 14	N/A	04/04/18 17:44	180404L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	360	1.0	0.21	1.00	

Method Blank	099-07-024-1538	N/A	Air	GC 14	N/A	04/03/18 11:33	180403L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	ND	1.0	0.21	1.00	

Method Blank	099-07-024-1537	N/A	Air	GC 14	N/A	04/04/18 11:49	180404L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	ND	1.0	0.21	1.00	



Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/03/18 Work Order: 18-04-0188 Preparation: N/A Method: EPA TO-3M Page 1 of 1
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
VSS01359	Sample	Air	GC 13	N/A	04/03/18 21:20	180403D02
VSS01359	Sample Duplicate	Air	GC 13	N/A	04/03/18 21:33	180403D02
<u>Parameter</u>		<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline		11570	11540	0	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-760	LCS	Air	GC 65	N/A	04/03/18 09:54	180403L01			
099-16-444-760	LCSD	Air	GC 65	N/A	04/03/18 10:13	180403L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	15.02	100	15.23	101	80-120	1	0-30	
Carbon Monoxide	7.020	6.722	96	6.743	96	80-120	0	0-30	
Oxygen (+ Argon)	3.990	3.913	98	3.835	96	80-120	2	0-30	
Nitrogen	69.45	64.51	93	64.33	93	80-120	0	0-30	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-761	LCS	Air	GC 65	N/A	04/04/18 10:29	180404L01			
099-16-444-761	LCSD	Air	GC 65	N/A	04/04/18 10:48	180404L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	14.88	99	15.10	101	80-120	1	0-30	
Carbon Monoxide	7.020	6.717	96	6.719	96	80-120	0	0-30	
Oxygen (+ Argon)	3.990	3.934	99	3.853	97	80-120	2	0-30	
Nitrogen	69.45	64.67	93	64.32	93	80-120	1	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8425	LCS	Air	GC/MS HH	N/A	04/05/18 12:27	180405L02
099-12-981-8425	LCSD	Air	GC/MS HH	N/A	04/05/18 13:20	180405L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02624	105	0.02657	106	50-150	33-167	1	0-35	
Benzene	0.02500	0.02625	105	0.02668	107	60-156	44-172	2	0-40	
Benzyl Chloride	0.02500	0.03020	121	0.02984	119	50-150	33-167	1	0-35	
Bromodichloromethane	0.02500	0.02692	108	0.02684	107	50-150	33-167	0	0-35	
Bromoform	0.02500	0.02781	111	0.02760	110	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02454	98	0.02467	99	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.02741	110	0.02755	110	50-150	33-167	1	0-35	
Carbon Disulfide	0.02500	0.02742	110	0.02764	111	50-150	33-167	1	0-35	
Carbon Tetrachloride	0.02500	0.02716	109	0.02726	109	64-154	49-169	0	0-32	
Chlorobenzene	0.02500	0.02774	111	0.02785	111	50-150	33-167	0	0-35	
Chloroethane	0.02500	0.02632	105	0.02600	104	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02659	106	0.02653	106	50-150	33-167	0	0-35	
Chloromethane	0.02500	0.02646	106	0.02679	107	50-150	33-167	1	0-35	
Dibromochloromethane	0.02500	0.02740	110	0.02740	110	50-150	33-167	0	0-35	
Dichlorodifluoromethane	0.02500	0.02621	105	0.02609	104	50-150	33-167	0	0-35	
1,1-Dichloroethane	0.02500	0.02667	107	0.02681	107	50-150	33-167	1	0-35	
1,1-Dichloroethene	0.02500	0.02933	117	0.02946	118	50-150	33-167	0	0-35	
1,2-Dibromoethane	0.02500	0.02766	111	0.02775	111	54-144	39-159	0	0-36	
Dichlorotetrafluoroethane	0.02500	0.02550	102	0.02543	102	50-150	33-167	0	0-35	
1,2-Dichlorobenzene	0.02500	0.02762	110	0.02759	110	34-160	13-181	0	0-47	
1,2-Dichloroethane	0.02500	0.02583	103	0.02577	103	69-153	55-167	0	0-35	
1,2-Dichloropropane	0.02500	0.02690	108	0.02720	109	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02810	112	0.02794	112	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02820	113	0.02804	112	36-156	16-176	1	0-47	
c-1,3-Dichloropropene	0.02500	0.02849	114	0.02882	115	61-157	45-173	1	0-35	
c-1,2-Dichloroethene	0.02500	0.02671	107	0.02688	108	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02634	105	0.02674	107	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02913	117	0.02949	118	50-150	33-167	1	0-35	
Ethylbenzene	0.02500	0.02812	112	0.02806	112	52-154	35-171	0	0-38	
4-Ethyltoluene	0.02500	0.02828	113	0.02825	113	50-150	33-167	0	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02728	109	0.02770	111	50-150	33-167	2	0-35	
2-Hexanone	0.02500	0.02637	105	0.02799	112	50-150	33-167	6	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02740	110	0.02742	110	50-150	33-167	0	0-35	
Methylene Chloride	0.02500	0.02807	112	0.02822	113	50-150	33-167	1	0-35	
4-Methyl-2-Pentanone	0.02500	0.02733	109	0.02775	111	50-150	33-167	2	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 20

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02701	108	0.02690	108	52-148	36-164	0	0-38	
p/m-Xylene	0.05000	0.05578	112	0.05552	111	42-156	23-175	0	0-41	
Styrene	0.02500	0.02776	111	0.02755	110	50-150	33-167	1	0-35	
Tetrachloroethene	0.02500	0.02720	109	0.02725	109	56-152	40-168	0	0-40	
Toluene	0.02500	0.02680	107	0.02670	107	56-146	41-161	0	0-43	
Trichloroethene	0.02500	0.02679	107	0.02692	108	63-159	47-175	1	0-34	
Trichlorofluoromethane	0.02500	0.02451	98	0.02447	98	50-150	33-167	0	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02862	114	0.02873	115	50-150	33-167	0	0-35	
1,1,1-Trichloroethane	0.02500	0.02585	103	0.02604	104	50-150	33-167	1	0-35	
1,1,2-Trichloroethane	0.02500	0.02692	108	0.02709	108	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02873	115	0.02858	114	50-150	33-167	1	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02701	108	0.02692	108	50-150	33-167	0	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02871	115	0.02866	115	50-150	33-167	0	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02809	112	0.02848	114	50-150	33-167	1	0-35	
Vinyl Acetate	0.02500	0.02726	109	0.02743	110	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02647	106	0.02648	106	45-177	23-199	0	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8425	LCS	Air	GC/MS HH	N/A	04/05/18 12:27	180405L02	
099-12-981-8425	LCSD	Air	GC/MS HH	N/A	04/05/18 13:20	180405L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02562	102	0.02527	101	57-129	
1,2-Dichloroethane-d4	0.02500	0.02310	92	0.02299	92	47-137	
Toluene-d8	0.02500	0.02465	99	0.02468	99	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8420	LCS	Air	GC/MS II	N/A	04/03/18 11:08	180403L02
099-12-981-8420	LCSD	Air	GC/MS II	N/A	04/03/18 11:58	180403L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02489	100	0.02489	100	50-150	33-167	0	0-35	
Benzene	0.02500	0.02350	94	0.02303	92	60-156	44-172	2	0-40	
Benzyl Chloride	0.02500	0.02398	96	0.02382	95	50-150	33-167	1	0-35	
Bromodichloromethane	0.02500	0.02289	92	0.02264	91	50-150	33-167	1	0-35	
Bromoform	0.02500	0.02521	101	0.02498	100	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02492	100	0.02471	99	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.01967	79	0.01958	78	50-150	33-167	0	0-35	
Carbon Disulfide	0.02500	0.02160	86	0.02131	85	50-150	33-167	1	0-35	
Carbon Tetrachloride	0.02500	0.02360	94	0.02318	93	64-154	49-169	2	0-32	
Chlorobenzene	0.02500	0.02528	101	0.02516	101	50-150	33-167	0	0-35	
Chloroethane	0.02500	0.02497	100	0.02479	99	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02200	88	0.02171	87	50-150	33-167	1	0-35	
Chloromethane	0.02500	0.02015	81	0.02003	80	50-150	33-167	1	0-35	
Dibromochloromethane	0.02500	0.02446	98	0.02431	97	50-150	33-167	1	0-35	
Dichlorodifluoromethane	0.02500	0.02181	87	0.02172	87	50-150	33-167	0	0-35	
1,1-Dichloroethane	0.02500	0.02156	86	0.02124	85	50-150	33-167	1	0-35	
1,1-Dichloroethene	0.02500	0.02366	95	0.02337	93	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02454	98	0.02445	98	54-144	39-159	0	0-36	
Dichlorotetrafluoroethane	0.02500	0.02373	95	0.02363	95	50-150	33-167	0	0-35	
1,2-Dichlorobenzene	0.02500	0.02512	100	0.02495	100	34-160	13-181	1	0-47	
1,2-Dichloroethane	0.02500	0.02137	85	0.02112	84	69-153	55-167	1	0-35	
1,2-Dichloropropane	0.02500	0.02243	90	0.02237	89	67-157	52-172	0	0-35	
1,3-Dichlorobenzene	0.02500	0.02489	100	0.02462	98	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02513	101	0.02500	100	36-156	16-176	1	0-47	
c-1,3-Dichloropropene	0.02500	0.02534	101	0.02488	100	61-157	45-173	2	0-35	
c-1,2-Dichloroethene	0.02500	0.02445	98	0.02412	96	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02419	97	0.02392	96	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02532	101	0.02512	100	50-150	33-167	1	0-35	
Ethylbenzene	0.02500	0.02495	100	0.02469	99	52-154	35-171	1	0-38	
4-Ethyltoluene	0.02500	0.02480	99	0.02457	98	50-150	33-167	1	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02562	102	0.02555	102	50-150	33-167	0	0-35	
2-Hexanone	0.02500	0.02303	92	0.02294	92	50-150	33-167	0	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02359	94	0.02346	94	50-150	33-167	1	0-35	
Methylene Chloride	0.02500	0.02564	103	0.02525	101	50-150	33-167	1	0-35	
4-Methyl-2-Pentanone	0.02500	0.02310	92	0.02274	91	50-150	33-167	2	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 20

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02317	93	0.02309	92	52-148	36-164	0	0-38	
p/m-Xylene	0.05000	0.04721	94	0.04672	93	42-156	23-175	1	0-41	
Styrene	0.02500	0.02516	101	0.02487	99	50-150	33-167	1	0-35	
Tetrachloroethene	0.02500	0.02568	103	0.02537	101	56-152	40-168	1	0-40	
Toluene	0.02500	0.02353	94	0.02334	93	56-146	41-161	1	0-43	
Trichloroethene	0.02500	0.02445	98	0.02423	97	63-159	47-175	1	0-34	
Trichlorofluoromethane	0.02500	0.02289	92	0.02262	90	50-150	33-167	1	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02305	92	0.02272	91	50-150	33-167	1	0-35	
1,1,1-Trichloroethane	0.02500	0.02277	91	0.02256	90	50-150	33-167	1	0-35	
1,1,2-Trichloroethane	0.02500	0.02393	96	0.02370	95	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02488	100	0.02479	99	50-150	33-167	0	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02295	92	0.02286	91	50-150	33-167	0	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02417	97	0.02403	96	50-150	33-167	1	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02852	114	0.02857	114	50-150	33-167	0	0-35	
Vinyl Acetate	0.02500	0.01907	76	0.01893	76	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02374	95	0.02346	94	45-177	23-199	1	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8420	LCS	Air	GC/MS II	N/A	04/03/18 11:08	180403L02	
099-12-981-8420	LCSD	Air	GC/MS II	N/A	04/03/18 11:58	180403L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02340	94	0.02392	96	57-129	
1,2-Dichloroethane-d4	0.02500	0.02167	87	0.02165	87	47-137	
Toluene-d8	0.02500	0.02449	98	0.02441	98	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8423	LCS	Air	GC/MS II	N/A	04/04/18 11:20	180404L02
099-12-981-8423	LCSD	Air	GC/MS II	N/A	04/04/18 12:09	180404L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02521	101	0.02569	103	50-150	33-167	2	0-35	
Benzene	0.02500	0.02372	95	0.02372	95	60-156	44-172	0	0-40	
Benzyl Chloride	0.02500	0.02412	96	0.02421	97	50-150	33-167	0	0-35	
Bromodichloromethane	0.02500	0.02321	93	0.02334	93	50-150	33-167	1	0-35	
Bromoform	0.02500	0.02502	100	0.02501	100	50-150	33-167	0	0-38	
Bromomethane	0.02500	0.02504	100	0.02528	101	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.02034	81	0.02040	82	50-150	33-167	0	0-35	
Carbon Disulfide	0.02500	0.02173	87	0.02182	87	50-150	33-167	0	0-35	
Carbon Tetrachloride	0.02500	0.02382	95	0.02386	95	64-154	49-169	0	0-32	
Chlorobenzene	0.02500	0.02538	102	0.02537	101	50-150	33-167	0	0-35	
Chloroethane	0.02500	0.02543	102	0.02542	102	50-150	33-167	0	0-35	
Chloroform	0.02500	0.02238	90	0.02226	89	50-150	33-167	1	0-35	
Chloromethane	0.02500	0.02134	85	0.02138	86	50-150	33-167	0	0-35	
Dibromochloromethane	0.02500	0.02446	98	0.02451	98	50-150	33-167	0	0-35	
Dichlorodifluoromethane	0.02500	0.02267	91	0.02264	91	50-150	33-167	0	0-35	
1,1-Dichloroethane	0.02500	0.02205	88	0.02200	88	50-150	33-167	0	0-35	
1,1-Dichloroethene	0.02500	0.02401	96	0.02426	97	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02463	99	0.02469	99	54-144	39-159	0	0-36	
Dichlorotetrafluoroethane	0.02500	0.02443	98	0.02436	97	50-150	33-167	0	0-35	
1,2-Dichlorobenzene	0.02500	0.02504	100	0.02524	101	34-160	13-181	1	0-47	
1,2-Dichloroethane	0.02500	0.02179	87	0.02175	87	69-153	55-167	0	0-35	
1,2-Dichloropropane	0.02500	0.02297	92	0.02309	92	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02469	99	0.02485	99	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02500	100	0.02527	101	36-156	16-176	1	0-47	
c-1,3-Dichloropropene	0.02500	0.02558	102	0.02570	103	61-157	45-173	0	0-35	
c-1,2-Dichloroethene	0.02500	0.02456	98	0.02452	98	50-150	33-167	0	0-35	
t-1,2-Dichloroethene	0.02500	0.02432	97	0.02407	96	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02570	103	0.02590	104	50-150	33-167	1	0-35	
Ethylbenzene	0.02500	0.02523	101	0.02521	101	52-154	35-171	0	0-38	
4-Ethyltoluene	0.02500	0.02505	100	0.02517	101	50-150	33-167	0	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02493	100	0.02587	103	50-150	33-167	4	0-35	
2-Hexanone	0.02500	0.02373	95	0.02391	96	50-150	33-167	1	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02397	96	0.02370	95	50-150	33-167	1	0-35	
Methylene Chloride	0.02500	0.02507	100	0.02562	102	50-150	33-167	2	0-35	
4-Methyl-2-Pentanone	0.02500	0.02394	96	0.02401	96	50-150	33-167	0	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 10 of 20

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02343	94	0.02351	94	52-148	36-164	0	0-38	
p/m-Xylene	0.05000	0.04759	95	0.04765	95	42-156	23-175	0	0-41	
Styrene	0.02500	0.02528	101	0.02519	101	50-150	33-167	0	0-35	
Tetrachloroethene	0.02500	0.02532	101	0.02546	102	56-152	40-168	1	0-40	
Toluene	0.02500	0.02355	94	0.02353	94	56-146	41-161	0	0-43	
Trichloroethene	0.02500	0.02452	98	0.02470	99	63-159	47-175	1	0-34	
Trichlorofluoromethane	0.02500	0.02312	92	0.02307	92	50-150	33-167	0	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02312	92	0.02317	93	50-150	33-167	0	0-35	
1,1,1-Trichloroethane	0.02500	0.02305	92	0.02316	93	50-150	33-167	0	0-35	
1,1,2-Trichloroethane	0.02500	0.02430	97	0.02445	98	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02519	101	0.02532	101	50-150	33-167	1	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02327	93	0.02335	93	50-150	33-167	0	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02437	97	0.02449	98	50-150	33-167	0	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02760	110	0.02917	117	50-150	33-167	6	0-35	
Vinyl Acetate	0.02500	0.01995	80	0.01985	79	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02442	98	0.02445	98	45-177	23-199	0	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 11 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8423	LCS	Air	GC/MS II	N/A	04/04/18 11:20	180404L02	
099-12-981-8423	LCSD	Air	GC/MS II	N/A	04/04/18 12:09	180404L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02386	95	0.02373	95	57-129	
1,2-Dichloroethane-d4	0.02500	0.02214	89	0.02192	88	47-137	
Toluene-d8	0.02500	0.02487	99	0.02466	99	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 12 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8422	LCS	Air	GC/MS ZZ	N/A	04/04/18 11:43	180404L02
099-12-981-8422	LCSD	Air	GC/MS ZZ	N/A	04/04/18 12:32	180404L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02468	99	0.02514	101	50-150	33-167	2	0-35	
Benzene	0.02500	0.02352	94	0.02387	95	60-156	44-172	2	0-40	
Benzyl Chloride	0.02500	0.02848	114	0.02880	115	50-150	33-167	1	0-35	
Bromodichloromethane	0.02500	0.02534	101	0.02568	103	50-150	33-167	1	0-35	
Bromoform	0.02500	0.02847	114	0.02884	115	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02745	110	0.02757	110	50-150	33-167	0	0-35	
2-Butanone	0.02500	0.02322	93	0.02355	94	50-150	33-167	1	0-35	
Carbon Disulfide	0.02500	0.02387	95	0.02415	97	50-150	33-167	1	0-35	
Carbon Tetrachloride	0.02500	0.02720	109	0.02742	110	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02567	103	0.02626	105	50-150	33-167	2	0-35	
Chloroethane	0.02500	0.02763	111	0.02741	110	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02398	96	0.02429	97	50-150	33-167	1	0-35	
Chloromethane	0.02500	0.02728	109	0.02713	109	50-150	33-167	1	0-35	
Dibromochloromethane	0.02500	0.02686	107	0.02723	109	50-150	33-167	1	0-35	
Dichlorodifluoromethane	0.02500	0.02762	110	0.02752	110	50-150	33-167	0	0-35	
1,1-Dichloroethane	0.02500	0.02356	94	0.02395	96	50-150	33-167	2	0-35	
1,1-Dichloroethene	0.02500	0.02424	97	0.02437	97	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02564	103	0.02611	104	54-144	39-159	2	0-36	
Dichlorotetrafluoroethane	0.02500	0.02889	116	0.02869	115	50-150	33-167	1	0-35	
1,2-Dichlorobenzene	0.02500	0.02804	112	0.02865	115	34-160	13-181	2	0-47	
1,2-Dichloroethane	0.02500	0.02416	97	0.02440	98	69-153	55-167	1	0-35	
1,2-Dichloropropane	0.02500	0.02412	96	0.02442	98	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02861	114	0.02909	116	50-150	33-167	2	0-35	
1,4-Dichlorobenzene	0.02500	0.02882	115	0.02917	117	36-156	16-176	1	0-47	
c-1,3-Dichloropropene	0.02500	0.02531	101	0.02568	103	61-157	45-173	1	0-35	
c-1,2-Dichloroethene	0.02500	0.02381	95	0.02434	97	50-150	33-167	2	0-35	
t-1,2-Dichloroethene	0.02500	0.02392	96	0.02443	98	50-150	33-167	2	0-35	
t-1,3-Dichloropropene	0.02500	0.02600	104	0.02636	105	50-150	33-167	1	0-35	
Ethylbenzene	0.02500	0.02586	103	0.02638	106	52-154	35-171	2	0-38	
4-Ethyltoluene	0.02500	0.02701	108	0.02741	110	50-150	33-167	1	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.03324	133	0.03370	135	50-150	33-167	1	0-35	
2-Hexanone	0.02500	0.02472	99	0.02529	101	50-150	33-167	2	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02264	91	0.02332	93	50-150	33-167	3	0-35	
Methylene Chloride	0.02500	0.02429	97	0.02479	99	50-150	33-167	2	0-35	
4-Methyl-2-Pentanone	0.02500	0.02427	97	0.02482	99	50-150	33-167	2	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 13 of 20

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02509	100	0.02547	102	52-148	36-164	2	0-38	
p/m-Xylene	0.05000	0.05312	106	0.05386	108	42-156	23-175	1	0-41	
Styrene	0.02500	0.02491	100	0.02543	102	50-150	33-167	2	0-35	
Tetrachloroethene	0.02500	0.02725	109	0.02777	111	56-152	40-168	2	0-40	
Toluene	0.02500	0.02419	97	0.02465	99	56-146	41-161	2	0-43	
Trichloroethene	0.02500	0.02542	102	0.02582	103	63-159	47-175	2	0-34	
Trichlorofluoromethane	0.02500	0.02435	97	0.02459	98	50-150	33-167	1	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02549	102	0.02584	103	50-150	33-167	1	0-35	
1,1,1-Trichloroethane	0.02500	0.02475	99	0.02513	101	50-150	33-167	2	0-35	
1,1,2-Trichloroethane	0.02500	0.02496	100	0.02525	101	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02752	110	0.02795	112	50-150	33-167	2	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02490	100	0.02537	101	50-150	33-167	2	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02833	113	0.02888	116	50-150	33-167	2	0-35	
1,2,4-Trichlorobenzene	0.02500	0.03137	125	0.03197	128	50-150	33-167	2	0-35	
Vinyl Acetate	0.02500	0.02259	90	0.02291	92	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02765	111	0.02762	110	45-177	23-199	0	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 14 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8422	LCS	Air	GC/MS ZZ	N/A	04/04/18 11:43	180404L02	
099-12-981-8422	LCSD	Air	GC/MS ZZ	N/A	04/04/18 12:32	180404L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02467	99	0.02430	97	57-129	
1,2-Dichloroethane-d4	0.02500	0.02395	96	0.02377	95	47-137	
Toluene-d8	0.02500	0.02473	99	0.02457	98	78-156	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 15 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-12-981-8426	LCS	Air	GC/MS ZZ	N/A	04/05/18 11:56	180405L02				
099-12-981-8426	LCSD	Air	GC/MS ZZ	N/A	04/05/18 12:44	180405L02				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02439	98	0.02472	99	50-150	33-167	1	0-35	
Benzene	0.02500	0.02309	92	0.02370	95	60-156	44-172	3	0-40	
Benzyl Chloride	0.02500	0.03044	122	0.03094	124	50-150	33-167	2	0-35	
Bromodichloromethane	0.02500	0.02612	104	0.02615	105	50-150	33-167	0	0-35	
Bromoform	0.02500	0.03094	124	0.03148	126	50-150	33-167	2	0-38	
Bromomethane	0.02500	0.02818	113	0.02784	111	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.02318	93	0.02356	94	50-150	33-167	2	0-35	
Carbon Disulfide	0.02500	0.02387	95	0.02409	96	50-150	33-167	1	0-35	
Carbon Tetrachloride	0.02500	0.02747	110	0.02771	111	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02587	103	0.02664	107	50-150	33-167	3	0-35	
Chloroethane	0.02500	0.02812	112	0.02785	111	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02416	97	0.02447	98	50-150	33-167	1	0-35	
Chloromethane	0.02500	0.02805	112	0.02776	111	50-150	33-167	1	0-35	
Dibromochloromethane	0.02500	0.02781	111	0.02820	113	50-150	33-167	1	0-35	
Dichlorodifluoromethane	0.02500	0.02896	116	0.02872	115	50-150	33-167	1	0-35	
1,1-Dichloroethane	0.02500	0.02355	94	0.02384	95	50-150	33-167	1	0-35	
1,1-Dichloroethene	0.02500	0.02440	98	0.02453	98	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02642	106	0.02693	108	54-144	39-159	2	0-36	
Dichlorotetrafluoroethane	0.02500	0.03004	120	0.02950	118	50-150	33-167	2	0-35	
1,2-Dichlorobenzene	0.02500	0.02926	117	0.03001	120	34-160	13-181	3	0-47	
1,2-Dichloroethane	0.02500	0.02466	99	0.02493	100	69-153	55-167	1	0-35	
1,2-Dichloropropane	0.02500	0.02402	96	0.02435	97	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02981	119	0.03047	122	50-150	33-167	2	0-35	
1,4-Dichlorobenzene	0.02500	0.03014	121	0.03069	123	36-156	16-176	2	0-47	
c-1,3-Dichloropropene	0.02500	0.02583	103	0.02581	103	61-157	45-173	0	0-35	
c-1,2-Dichloroethene	0.02500	0.02359	94	0.02409	96	50-150	33-167	2	0-35	
t-1,2-Dichloroethene	0.02500	0.02363	95	0.02406	96	50-150	33-167	2	0-35	
t-1,3-Dichloropropene	0.02500	0.02683	107	0.02679	107	50-150	33-167	0	0-35	
Ethylbenzene	0.02500	0.02589	104	0.02669	107	52-154	35-171	3	0-38	
4-Ethyltoluene	0.02500	0.02735	109	0.02789	112	50-150	33-167	2	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.03713	149	0.03778	151	50-150	33-167	2	0-35	ME
2-Hexanone	0.02500	0.02482	99	0.02529	101	50-150	33-167	2	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02180	87	0.02248	90	50-150	33-167	3	0-35	
Methylene Chloride	0.02500	0.02398	96	0.02435	97	50-150	33-167	1	0-35	
4-Methyl-2-Pentanone	0.02500	0.02464	99	0.02497	100	50-150	33-167	1	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 16 of 20

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02525	101	0.02594	104	52-148	36-164	3	0-38	
p/m-Xylene	0.05000	0.05425	108	0.05534	111	42-156	23-175	2	0-41	
Styrene	0.02500	0.02515	101	0.02597	104	50-150	33-167	3	0-35	
Tetrachloroethene	0.02500	0.02708	108	0.02780	111	56-152	40-168	3	0-40	
Toluene	0.02500	0.02410	96	0.02451	98	56-146	41-161	2	0-43	
Trichloroethene	0.02500	0.02594	104	0.02601	104	63-159	47-175	0	0-34	
Trichlorofluoromethane	0.02500	0.02481	99	0.02484	99	50-150	33-167	0	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02562	102	0.02570	103	50-150	33-167	0	0-35	
1,1,1-Trichloroethane	0.02500	0.02496	100	0.02526	101	50-150	33-167	1	0-35	
1,1,2-Trichloroethane	0.02500	0.02556	102	0.02562	102	65-149	51-163	0	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02790	112	0.02843	114	50-150	33-167	2	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02631	105	0.02698	108	50-150	33-167	3	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02903	116	0.02968	119	50-150	33-167	2	0-35	
1,2,4-Trichlorobenzene	0.02500	0.03547	142	0.03650	146	50-150	33-167	3	0-35	
Vinyl Acetate	0.02500	0.02269	91	0.02288	92	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02829	113	0.02798	112	45-177	23-199	1	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 1

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 17 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8426	LCS	Air	GC/MS ZZ	N/A	04/05/18 11:56	180405L02	
099-12-981-8426	LCSD	Air	GC/MS ZZ	N/A	04/05/18 12:44	180405L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02490	100	0.02446	98	57-129	
1,2-Dichloroethane-d4	0.02500	0.02483	99	0.02444	98	47-137	
Toluene-d8	0.02500	0.02513	101	0.02472	99	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: EPA TO-3M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 18 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8393	LCS	Air	GC 13	N/A	04/03/18 18:55	180403L02
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	196.2	98	80-120	

Return to Contents



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: SCAQMD 25.1M
Page 19 of 20

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1538	LCS	Air	GC 14	N/A	04/03/18 10:50	180403L01			
099-07-024-1538	LCSD	Air	GC 14	N/A	04/03/18 11:13	180403L01			
<u>Parameter</u>	<u>Spike Added</u>	<u>LCS Conc.</u>	<u>LCS %Rec.</u>	<u>LCSD Conc.</u>	<u>LCSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Methane	101.0	105.6	105	102.6	102	80-120	3	0-20	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/03/18
Work Order: 18-04-0188
Preparation: N/A
Method: SCAQMD 25.1M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 20 of 20

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1537	LCS	Air	GC 14	N/A	04/04/18 10:57	180404L01			
099-07-024-1537	LCSD	Air	GC 14	N/A	04/04/18 11:17	180404L01			
<u>Parameter</u>	<u>Spike Added</u>	<u>LCS Conc.</u>	<u>LCS %Rec.</u>	<u>LCSD Conc.</u>	<u>LCSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Methane	101.0	106.1	105	104.5	104	80-120	1	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits

Sample Analysis Summary Report

Work Order: 18-04-0188

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	1144	GC 65	2
ASTM D-1946	N/A	1145	GC 65	2
EPA TO-15M	N/A	866	GC/MS II	2
EPA TO-15M	N/A	1087	GC/MS HH	2
EPA TO-15M	N/A	1087	GC/MS ZZ	2
EPA TO-3M	N/A	748	GC 13	2
EPA TO-3M	N/A	1144	GC 13	2
EPA TO-3M	N/A	1145	GC 13	2
SCAQMD 25.1M	N/A	748	GC 14	2
SCAQMD 25.1M	N/A	1144	GC 14	2
SCAQMD 25.1M	N/A	1145	GC 14	2


Return to Contents

Glossary of Terms and Qualifiers

Work Order: 18-04-0188

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

AECOM

Shell Oil Products US Chain Of Custody Record



LAB (LOCATION)

☐ ACCUTEST ()
☒ CALSCIENCE ()
☐ TESTAMERICA ()
☐ Other ()

Lab Vendor # 1080777 (CalScience)

SAMPLING COMPANY:

AECOM

ADDRESS: 130 Robin Hill Road, Suite 100, Santa Barbara CA, 93117

PROJECT CONTACT (Handcopy or PDF Report to)

Julie Doane-Allmon

TELEPHONE: 805-692-0618

FAX: 805-964-0259

BRI To Contact E-MAIL: julie.doane-allmon@aecom.com

TURNAROUND TIME (CALENDAR DAYS):

☒ STANDARD (14 DAY)☐ 5 DAYS☐ 3 DAYS☐ 24 HOURS☐ RESULTS NEEDED ON WEEKEND☐ LA - RWQCB REPORT FORMAT☐ UST AGENCY:☐ LEVEL 1☐ LEVEL 2☒ LEVEL 3☐ LEVEL 4☐ OTHER (SPECIFY) _____

Cooler #1

Cooler #2

Cooler #3

SPECIAL INSTRUCTIONS OR NOTES:

Email results to: julie.doane-allmon@aecom.com;

daniel.grasmick@aecom.com; steve.j.cole@aecom.com;

jude.francis@aecom.com; and margaret.pittman@aecom.com

☒ SHELL CONTRACT RATE APPLIES☐ STATE REIMBURSEMENT RATE APPLIES☐ EDD NOT NEEDED☐ RECEIPT VERIFICATION REQUESTED☐ PROVIDE LEAD DISK

LOG CODE: _____

Print Bill To Contact Name: Julie Doane-Allmon

PO # 964833

USCH/00305

AECOM Project / Task Number: 60566446.2018.1.0601

E-MAIL: steve.j.cole@aecom.com

Direct: 213-996-2398

300 S. Grand Ave., Ste. 800, LA, CA 90071

SAMPLER NAME(S) (Print): Maggie Pittman

LAB USE ONLY

18-04-0188

FIELD NOTES:

TEMPERATURE ON RECEIPT C°

Container PID Readings or Laboratory Notes

SCAQMD 25.1 Methane (ppmv)

ASTM Method D-1946 Fixed

EPA TO-3M (TPH as gasoline)

EPA TO-15M

Gases

Date: 4/3/18

Time: 1629

Date: 4/3/18

Time: 1745

Version: 11Dec15

Return to Contents

[Return to Contents](#)

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: ArcomDATE: 04/3/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): _____ °C (w/ CF): _____ °C; ☐ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☒ Air ☐ FilterChecked by: 1091

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☐ Not Present ☒ N/AChecked by: 1091Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/AChecked by: 300

SAMPLE CONDITION:

Chain-of-Custody (COC) document(s) received with samples ☒ Yes ☐ No ☐ N/ACOC document(s) received complete ☒ Yes ☐ No ☐ N/A☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished timeSampler's name indicated on COC ☒ Yes ☐ No ☐ N/ASample container label(s) consistent with COC ☒ Yes ☐ No ☐ N/ASample container(s) intact and in good condition ☒ Yes ☐ No ☐ N/AProper containers for analyses requested ☒ Yes ☐ No ☐ N/ASufficient volume/mass for analyses requested ☒ Yes ☐ No ☐ N/ASamples received within holding time ☒ Yes ☐ No ☐ N/A

Aqueous samples for certain analyses received within 15-minute holding time

☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen ☐ Yes ☐ No ☒ N/AProper preservation chemical(s) noted on COC and/or sample container ☐ Yes ☐ No ☒ N/A

Unpreserved aqueous sample(s) received for certain analyses

☐ Volatile Organics ☐ Total Metals ☐ Dissolved MetalsAcid/base preserved samples - pH within acceptable range ☐ Yes ☐ No ☒ N/AContainer(s) for certain analysis free of headspace ☐ Yes ☐ No ☒ N/A☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)Tedlar™ bag(s) free of condensation ☒ Yes ☐ No ☐ N/A

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOAh ☐ VOAna₂ ☐ 100PJ ☐ 100PJna₂ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 125PB ☐ 125PBznna (pH__9)☐ 250AGB ☐ 250CGB ☐ 250CGBs (pH__2) ☐ 250PB ☐ 250PBn (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJs (pH__2) ☐ 500PB☐ 1AGB ☐ 1AGBna₂ ☐ 1AGBs (pH__2) ☐ 1AGBs (O&G) ☐ 1PB ☐ 1PBna (pH__12) ☐ _____ ☐ _____ ☐ _____Solid: ☒ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____Air: ☒ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 300s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, znna = Zn (CH₃CO₂)₂ + NaOHReviewed by: 836



Supplemental Report 3

The original report has been revised/corrected.

**WORK ORDER NUMBER: 18-04-0574***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** AECOM**Client Project Name:** Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601**Attention:** Julie Doane-Allmon
130 Robin Hill Road
Suite 100
Santa Barbara, CA 93117-3153*Vikas Patel*Approved for release on 06/20/2018 by:
Vikas Patel
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
 Work Order Number: 18-04-0574

1	Work Order Narrative.	3
2	Sample Summary.	4
3	QC Association Summary.	5
4	Detections Summary.	6
5	Client Sample Data.	8
	5.1 ASTM D-1946 Fixed Gases (Air).	8
	5.2 EPA TO-15 (M) Full List (Air).	10
	5.3 EPA TO-15 (M) Full List + Oxygenates (Air).	24
	5.4 EPA TO-3 (M) TPH Gasoline (Air).	30
	5.5 SCAQMD 25.1 TGNMO and CH4 (Air).	32
6	Quality Control Sample Data.	33
	6.1 Sample Duplicate.	33
	6.2 LCS/LCSD.	34
7	Sample Analysis Summary.	43
8	Glossary of Terms and Qualifiers.	44
9	Chain-of-Custody/Sample Receipt Form.	45

Work Order Narrative

Work Order: 18-04-0574

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/06/18. They were assigned to Work Order 18-04-0574.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



Calscience

Sample Summary

Client: AECOM	Work Order: 18-04-0574
130 Robin Hill Road, Suite 100	Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Santa Barbara, CA 93117-3153	PO Number: 100067
	Date/Time Received: 04/06/18 18:10
	Number of Containers: 8

Attn: Julie Doane-Allmon

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VSS01366	18-04-0574-1	04/05/18 12:00	1	Air
VSS01365	18-04-0574-2	04/05/18 12:01	2	Air
VSS01367	18-04-0574-3	04/05/18 12:05	1	Air
VSS01368	18-04-0574-4	04/06/18 14:55	2	Air
VSS01369	18-04-0574-5	04/06/18 15:00	1	Air
VSS01370	18-04-0574-6	04/06/18 15:05	1	Air


Return to Contents

QC Association Summary

Work Order: 18-04-0574

Page 1 of 1

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01366	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180407L01
VSS01366	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180406L02
VSS01366	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01
VSS01366	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180407L02
VSS01365	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180407L01
VSS01365	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180406L02
VSS01365	EPA TO-15 (M) Full List	R	N/A	GC/MS II	*1	180406L02
VSS01365	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01
VSS01365	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180407L02
VSS01367	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180409L02
VSS01367	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01
VSS01368	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180407L01
VSS01368	EPA TO-15 (M) Full List + Oxygenates		N/A	GC/MS II	*2	180406L02
VSS01368	EPA TO-15 (M) Full List + Oxygenates	R	N/A	GC/MS II	*1	180406L02
VSS01368	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01
VSS01368	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180407L02
VSS01369	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180407L01
VSS01369	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180406L02
VSS01369	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01
VSS01369	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180407L02
VSS01370	EPA TO-15 (M) Full List		N/A	GC/MS II	*2	180409L02
VSS01370	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180406D01	180406L01



Return to Contents

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0574
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/06/18

Attn: Julie Doane-Allmon

Page 1 of 2

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01366 (18-04-0574-1)						
Carbon Dioxide	1.19		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	19.8		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.0		0.500	%v	ASTM D-1946	N/A
Acetone	16	J	2.9*	ppm (v/v)	EPA TO-15M	N/A
Benzene	980		5.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	670		5.0	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.97	J	0.64*	ppm (v/v)	EPA TO-15M	N/A
Toluene	20	J	1.3*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	1700		10	ppm (v/v)	EPA TO-3M	N/A
Methane	26		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01365 (18-04-0574-2)						
Carbon Dioxide	11.0		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	5.63		0.500	%v	ASTM D-1946	N/A
Nitrogen	83.4		0.500	%v	ASTM D-1946	N/A
Benzene	7600		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1900		40	ppm (v/v)	EPA TO-15M	N/A
Toluene	87	J	11*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	13000		100	ppm (v/v)	EPA TO-3M	N/A
Methane	260		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01367 (18-04-0574-3)						
Acetone	0.042	J,BU	0.0072*	ppm (v/v)	EPA TO-15M	N/A
Benzene	1.3	BU	0.012	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2.2	BU	0.012	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.033	J,BU	0.0034*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	6.7		2.0	ppm (v/v)	EPA TO-3M	N/A

* MDL is shown



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0574
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/06/18

Attn: Julie Doane-Allmon

Page 2 of 2

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01368 (18-04-0574-4)						
Carbon Dioxide	12.4		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	4.93		0.500	%v	ASTM D-1946	N/A
Nitrogen	82.7		0.500	%v	ASTM D-1946	N/A
Benzene	7600		100	ppm (v/v)	EPA TO-15M	N/A
Cyclohexane	87		40	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3000		40	ppm (v/v)	EPA TO-15M	N/A
Heptane	710		160	ppm (v/v)	EPA TO-15M	N/A
Hexane	25	J	13*	ppm (v/v)	EPA TO-15M	N/A
Toluene	110	J	11*	ppm (v/v)	EPA TO-15M	N/A
Methanol	220	J	110*	ppm (v/v)	EPA TO-15M	N/A
Isopropanol	25	J	20*	ppm (v/v)	EPA TO-15M	N/A
Isopropylbenzene	19	J	17*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	19000		200	ppm (v/v)	EPA TO-3M	N/A
Methane	250		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01369 (18-04-0574-5)						
Carbon Dioxide	1.18		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	19.9		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.9		0.500	%v	ASTM D-1946	N/A
Acetone	31	J	2.9*	ppm (v/v)	EPA TO-15M	N/A
Benzene	660		5.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	320		5.0	ppm (v/v)	EPA TO-15M	N/A
Toluene	13	J	1.3*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	1600		20	ppm (v/v)	EPA TO-3M	N/A
Methane	23		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01370 (18-04-0574-6)						
Acetone	0.0059	J	0.0057*	ppm (v/v)	EPA TO-15M	N/A
Benzene	0.88		0.010	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1.6		0.010	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.027	J	0.0027*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	8.4		2.0	ppm (v/v)	EPA TO-3M	N/A

Subcontracted analyses, if any, are not included in this summary.

* MDL is shown



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01366	18-04-0574-1-A	04/05/18 12:00	Air	GC 65	N/A	04/07/18 11:02	180407L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	1.19	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	19.8	0.500	0.205	1.00	
Nitrogen	79.0	0.500	0.477	1.00	

VSS01365	18-04-0574-2-A	04/05/18 12:01	Air	GC 65	N/A	04/07/18 11:26	180407L01
----------	----------------	----------------	-----	-------	-----	----------------	-----------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	11.0	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	5.63	0.500	0.205	1.00	
Nitrogen	83.4	0.500	0.477	1.00	

VSS01368	18-04-0574-4-A	04/06/18 14:55	Air	GC 65	N/A	04/07/18 11:46	180407L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	12.4	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	4.93	0.500	0.205	1.00	
Nitrogen	82.7	0.500	0.477	1.00	

VSS01369	18-04-0574-5-A	04/06/18 15:00	Air	GC 65	N/A	04/07/18 12:12	180407L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	1.18	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	19.9	0.500	0.205	1.00	
Nitrogen	78.9	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-16-444-762	N/A	Air	GC 65	N/A	04/07/18 10:23	180407L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01366	18-04-0574-1-A	04/05/18 12:00	Air	GC/MS II	N/A	04/07/18 03:03	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	16	500	2.9	10000	J
Benzene	980	5.0	0.85	10000	
Benzyl Chloride	ND	15	0.49	10000	
Bromodichloromethane	ND	5.0	0.62	10000	
Bromoform	ND	5.0	0.81	10000	
Bromomethane	ND	5.0	1.4	10000	
2-Butanone	ND	15	4.3	10000	
Carbon Disulfide	ND	100	2.8	10000	
Carbon Tetrachloride	ND	5.0	0.62	10000	
Chlorobenzene	ND	5.0	0.68	10000	
Chloroethane	ND	5.0	2.4	10000	
Chloroform	ND	5.0	0.69	10000	
Chloromethane	ND	5.0	2.4	10000	
Dibromochloromethane	ND	5.0	0.55	10000	
Dichlorodifluoromethane	ND	5.0	0.60	10000	
1,1-Dichloroethane	ND	5.0	0.63	10000	
1,1-Dichloroethene	ND	5.0	2.0	10000	
1,2-Dibromoethane	ND	5.0	0.69	10000	
Dichlorotetrafluoroethane	ND	20	2.7	10000	
1,2-Dichlorobenzene	ND	5.0	0.53	10000	
1,2-Dichloroethane	ND	5.0	0.69	10000	
1,2-Dichloropropane	ND	5.0	1.9	10000	
1,3-Dichlorobenzene	ND	5.0	1.6	10000	
1,4-Dichlorobenzene	ND	5.0	0.67	10000	
c-1,3-Dichloropropene	ND	5.0	0.65	10000	
c-1,2-Dichloroethene	ND	5.0	0.87	10000	
t-1,2-Dichloroethene	ND	5.0	1.3	10000	
t-1,3-Dichloropropene	ND	10	0.69	10000	
Ethylbenzene	670	5.0	1.4	10000	
4-Ethyltoluene	ND	5.0	1.6	10000	
Hexachloro-1,3-Butadiene	ND	15	1.0	10000	
2-Hexanone	ND	15	4.4	10000	
Methyl-t-Butyl Ether (MTBE)	ND	20	1.5	10000	
Methylene Chloride	ND	50	2.5	10000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	15	3.7	10000	
o-Xylene	ND	5.0	1.6	10000	
p/m-Xylene	ND	20	3.3	10000	
Styrene	0.97	15	0.64	10000	J
Tetrachloroethene	ND	5.0	0.67	10000	
Toluene	20	50	1.3	10000	J
Trichloroethene	ND	5.0	0.69	10000	
Trichlorofluoromethane	ND	10	1.7	10000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	15	0.70	10000	
1,1,1-Trichloroethane	ND	5.0	0.79	10000	
1,1,2-Trichloroethane	ND	5.0	1.8	10000	
1,3,5-Trimethylbenzene	ND	5.0	1.4	10000	
1,1,2,2-Tetrachloroethane	ND	10	1.4	10000	
1,2,4-Trimethylbenzene	ND	15	1.5	10000	
1,2,4-Trichlorobenzene	ND	20	1.2	10000	
Vinyl Acetate	ND	20	0.98	10000	
Vinyl Chloride	ND	5.0	2.2	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	98	47-137	
Toluene-d8	102	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01365	18-04-0574-2-A	04/05/18 12:01	Air	GC/MS II	N/A	04/07/18 04:41	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	4000	23	80000	
Benzyl Chloride	ND	120	3.9	80000	
Bromodichloromethane	ND	40	5.0	80000	
Bromoform	ND	40	6.5	80000	
Bromomethane	ND	40	11	80000	
2-Butanone	ND	120	35	80000	
Carbon Disulfide	ND	800	22	80000	
Carbon Tetrachloride	ND	40	4.9	80000	
Chlorobenzene	ND	40	5.4	80000	
Chloroethane	ND	40	19	80000	
Chloroform	ND	40	5.5	80000	
Chloromethane	ND	40	19	80000	
Dibromochloromethane	ND	40	4.4	80000	
Dichlorodifluoromethane	ND	40	4.8	80000	
1,1-Dichloroethane	ND	40	5.0	80000	
1,1-Dichloroethene	ND	40	16	80000	
1,2-Dibromoethane	ND	40	5.5	80000	
Dichlorotetrafluoroethane	ND	160	21	80000	
1,2-Dichlorobenzene	ND	40	4.2	80000	
1,2-Dichloroethane	ND	40	5.5	80000	
1,2-Dichloropropane	ND	40	15	80000	
1,3-Dichlorobenzene	ND	40	13	80000	
1,4-Dichlorobenzene	ND	40	5.4	80000	
c-1,3-Dichloropropene	ND	40	5.2	80000	
c-1,2-Dichloroethene	ND	40	7.0	80000	
t-1,2-Dichloroethene	ND	40	10	80000	
t-1,3-Dichloropropene	ND	80	5.5	80000	
Ethylbenzene	1900	40	12	80000	
4-Ethyltoluene	ND	40	13	80000	
Hexachloro-1,3-Butadiene	ND	120	8.2	80000	
2-Hexanone	ND	120	35	80000	
Methyl-t-Butyl Ether (MTBE)	ND	160	12	80000	
Methylene Chloride	ND	400	20	80000	
4-Methyl-2-Pentanone	ND	120	30	80000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	40	13	80000	
p/m-Xylene	ND	160	27	80000	
Styrene	ND	120	5.1	80000	
Tetrachloroethene	ND	40	5.4	80000	
Toluene	87	400	11	80000	J
Trichloroethene	ND	40	5.6	80000	
Trichlorofluoromethane	ND	80	14	80000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	120	5.6	80000	
1,1,1-Trichloroethane	ND	40	6.3	80000	
1,1,2-Trichloroethane	ND	40	15	80000	
1,3,5-Trimethylbenzene	ND	40	12	80000	
1,1,2,2-Tetrachloroethane	ND	80	11	80000	
1,2,4-Trimethylbenzene	ND	120	12	80000	
1,2,4-Trichlorobenzene	ND	160	9.9	80000	
Vinyl Acetate	ND	160	7.8	80000	
Vinyl Chloride	ND	40	18	80000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	102	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01365	18-04-0574-2-A	04/05/18 12:01	Air	GC/MS II	N/A	04/07/18 05:36	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	7600	80	14	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	101	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01367	18-04-0574-3-A	04/05/18 12:05	Air	GC/MS II	N/A	04/09/18 18:01	180409L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.
- Sample analysis requested after recommended holding time.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.042	1.2	0.0072	25.0	J,BU
Benzene	1.3	0.012	0.0021	25.0	BU
Benzyl Chloride	ND	0.038	0.0012	25.0	BU
Bromodichloromethane	ND	0.012	0.0015	25.0	BU
Bromoform	ND	0.012	0.0020	25.0	BU
Bromomethane	ND	0.012	0.0035	25.0	BU
2-Butanone	ND	0.038	0.011	25.0	BU
Carbon Disulfide	ND	0.25	0.0070	25.0	BU
Carbon Tetrachloride	ND	0.012	0.0015	25.0	BU
Chlorobenzene	ND	0.012	0.0017	25.0	BU
Chloroethane	ND	0.012	0.0060	25.0	BU
Chloroform	ND	0.012	0.0017	25.0	BU
Chloromethane	ND	0.012	0.0060	25.0	BU
Dibromochloromethane	ND	0.012	0.0014	25.0	BU
Dichlorodifluoromethane	ND	0.012	0.0015	25.0	BU
1,1-Dichloroethane	ND	0.012	0.0016	25.0	BU
1,1-Dichloroethene	ND	0.012	0.0050	25.0	BU
1,2-Dibromoethane	ND	0.012	0.0017	25.0	BU
Dichlorotetrafluoroethane	ND	0.050	0.0066	25.0	BU
1,2-Dichlorobenzene	ND	0.012	0.0013	25.0	BU
1,2-Dichloroethane	ND	0.012	0.0017	25.0	BU
1,2-Dichloropropane	ND	0.012	0.0048	25.0	BU
1,3-Dichlorobenzene	ND	0.012	0.0040	25.0	BU
1,4-Dichlorobenzene	ND	0.012	0.0017	25.0	BU
c-1,3-Dichloropropene	ND	0.012	0.0016	25.0	BU
c-1,2-Dichloroethene	ND	0.012	0.0022	25.0	BU
t-1,2-Dichloroethene	ND	0.012	0.0032	25.0	BU
t-1,3-Dichloropropene	ND	0.025	0.0017	25.0	BU
Ethylbenzene	2.2	0.012	0.0036	25.0	BU
4-Ethyltoluene	ND	0.012	0.0040	25.0	BU
Hexachloro-1,3-Butadiene	ND	0.038	0.0026	25.0	BU
2-Hexanone	ND	0.038	0.011	25.0	BU
Methyl-t-Butyl Ether (MTBE)	ND	0.050	0.0038	25.0	BU

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Methylene Chloride	ND	0.12	0.0062	25.0	BU
4-Methyl-2-Pentanone	ND	0.038	0.0093	25.0	BU
o-Xylene	ND	0.012	0.0039	25.0	BU
p/m-Xylene	ND	0.050	0.0083	25.0	BU
Styrene	ND	0.038	0.0016	25.0	BU
Tetrachloroethene	ND	0.012	0.0017	25.0	BU
Toluene	0.033	0.12	0.0034	25.0	J,BU
Trichloroethene	ND	0.012	0.0017	25.0	BU
Trichlorofluoromethane	ND	0.025	0.0043	25.0	BU
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.038	0.0018	25.0	BU
1,1,1-Trichloroethane	ND	0.012	0.0020	25.0	BU
1,1,2-Trichloroethane	ND	0.012	0.0046	25.0	BU
1,3,5-Trimethylbenzene	ND	0.012	0.0036	25.0	BU
1,1,2,2-Tetrachloroethane	ND	0.025	0.0034	25.0	BU
1,2,4-Trimethylbenzene	ND	0.038	0.0038	25.0	BU
1,2,4-Trichlorobenzene	ND	0.050	0.0031	25.0	BU
Vinyl Acetate	ND	0.050	0.0024	25.0	BU
Vinyl Chloride	ND	0.012	0.0056	25.0	BU

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	106	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01369	18-04-0574-5-A	04/06/18 15:00	Air	GC/MS II	N/A	04/07/18 08:12	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	31	500	2.9	10000	J
Benzene	660	5.0	0.85	10000	
Benzyl Chloride	ND	15	0.49	10000	
Bromodichloromethane	ND	5.0	0.62	10000	
Bromoform	ND	5.0	0.81	10000	
Bromomethane	ND	5.0	1.4	10000	
2-Butanone	ND	15	4.3	10000	
Carbon Disulfide	ND	100	2.8	10000	
Carbon Tetrachloride	ND	5.0	0.62	10000	
Chlorobenzene	ND	5.0	0.68	10000	
Chloroethane	ND	5.0	2.4	10000	
Chloroform	ND	5.0	0.69	10000	
Chloromethane	ND	5.0	2.4	10000	
Dibromochloromethane	ND	5.0	0.55	10000	
Dichlorodifluoromethane	ND	5.0	0.60	10000	
1,1-Dichloroethane	ND	5.0	0.63	10000	
1,1-Dichloroethene	ND	5.0	2.0	10000	
1,2-Dibromoethane	ND	5.0	0.69	10000	
Dichlorotetrafluoroethane	ND	20	2.7	10000	
1,2-Dichlorobenzene	ND	5.0	0.53	10000	
1,2-Dichloroethane	ND	5.0	0.69	10000	
1,2-Dichloropropane	ND	5.0	1.9	10000	
1,3-Dichlorobenzene	ND	5.0	1.6	10000	
1,4-Dichlorobenzene	ND	5.0	0.67	10000	
c-1,3-Dichloropropene	ND	5.0	0.65	10000	
c-1,2-Dichloroethene	ND	5.0	0.87	10000	
t-1,2-Dichloroethene	ND	5.0	1.3	10000	
t-1,3-Dichloropropene	ND	10	0.69	10000	
Ethylbenzene	320	5.0	1.4	10000	
4-Ethyltoluene	ND	5.0	1.6	10000	
Hexachloro-1,3-Butadiene	ND	15	1.0	10000	
2-Hexanone	ND	15	4.4	10000	
Methyl-t-Butyl Ether (MTBE)	ND	20	1.5	10000	
Methylene Chloride	ND	50	2.5	10000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	15	3.7	10000	
o-Xylene	ND	5.0	1.6	10000	
p/m-Xylene	ND	20	3.3	10000	
Styrene	ND	15	0.64	10000	
Tetrachloroethene	ND	5.0	0.67	10000	
Toluene	13	50	1.3	10000	J
Trichloroethene	ND	5.0	0.69	10000	
Trichlorofluoromethane	ND	10	1.7	10000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	15	0.70	10000	
1,1,1-Trichloroethane	ND	5.0	0.79	10000	
1,1,2-Trichloroethane	ND	5.0	1.8	10000	
1,3,5-Trimethylbenzene	ND	5.0	1.4	10000	
1,1,2,2-Tetrachloroethane	ND	10	1.4	10000	
1,2,4-Trimethylbenzene	ND	15	1.5	10000	
1,2,4-Trichlorobenzene	ND	20	1.2	10000	
Vinyl Acetate	ND	20	0.98	10000	
Vinyl Chloride	ND	5.0	2.2	10000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	104	47-137	
Toluene-d8	100	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01370	18-04-0574-6-A	04/06/18 15:05	Air	GC/MS II	N/A	04/09/18 16:26	180409L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.0059	1.0	0.0057	20.0	J
Benzene	0.88	0.010	0.0017	20.0	
Benzyl Chloride	ND	0.030	0.00098	20.0	
Bromodichloromethane	ND	0.010	0.0012	20.0	
Bromoform	ND	0.010	0.0016	20.0	
Bromomethane	ND	0.010	0.0028	20.0	
2-Butanone	ND	0.030	0.0086	20.0	
Carbon Disulfide	ND	0.20	0.0056	20.0	
Carbon Tetrachloride	ND	0.010	0.0012	20.0	
Chlorobenzene	ND	0.010	0.0014	20.0	
Chloroethane	ND	0.010	0.0048	20.0	
Chloroform	ND	0.010	0.0014	20.0	
Chloromethane	ND	0.010	0.0048	20.0	
Dibromochloromethane	ND	0.010	0.0011	20.0	
Dichlorodifluoromethane	ND	0.010	0.0012	20.0	
1,1-Dichloroethane	ND	0.010	0.0013	20.0	
1,1-Dichloroethene	ND	0.010	0.0040	20.0	
1,2-Dibromoethane	ND	0.010	0.0014	20.0	
Dichlorotetrafluoroethane	ND	0.040	0.0053	20.0	
1,2-Dichlorobenzene	ND	0.010	0.0011	20.0	
1,2-Dichloroethane	ND	0.010	0.0014	20.0	
1,2-Dichloropropane	ND	0.010	0.0038	20.0	
1,3-Dichlorobenzene	ND	0.010	0.0032	20.0	
1,4-Dichlorobenzene	ND	0.010	0.0013	20.0	
c-1,3-Dichloropropene	ND	0.010	0.0013	20.0	
c-1,2-Dichloroethene	ND	0.010	0.0017	20.0	
t-1,2-Dichloroethene	ND	0.010	0.0025	20.0	
t-1,3-Dichloropropene	ND	0.020	0.0014	20.0	
Ethylbenzene	1.6	0.010	0.0029	20.0	
4-Ethyltoluene	ND	0.010	0.0032	20.0	
Hexachloro-1,3-Butadiene	ND	0.030	0.0020	20.0	
2-Hexanone	ND	0.030	0.0088	20.0	
Methyl-t-Butyl Ether (MTBE)	ND	0.040	0.0031	20.0	
Methylene Chloride	ND	0.10	0.0050	20.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 10 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.030	0.0074	20.0	
o-Xylene	ND	0.010	0.0031	20.0	
p/m-Xylene	ND	0.040	0.0067	20.0	
Styrene	ND	0.030	0.0013	20.0	
Tetrachloroethene	ND	0.010	0.0013	20.0	
Toluene	0.027	0.10	0.0027	20.0	J
Trichloroethene	ND	0.010	0.0014	20.0	
Trichlorofluoromethane	ND	0.020	0.0034	20.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.030	0.0014	20.0	
1,1,1-Trichloroethane	ND	0.010	0.0016	20.0	
1,1,2-Trichloroethane	ND	0.010	0.0036	20.0	
1,3,5-Trimethylbenzene	ND	0.010	0.0029	20.0	
1,1,2,2-Tetrachloroethane	ND	0.020	0.0028	20.0	
1,2,4-Trimethylbenzene	ND	0.030	0.0031	20.0	
1,2,4-Trichlorobenzene	ND	0.040	0.0025	20.0	
Vinyl Acetate	ND	0.040	0.0020	20.0	
Vinyl Chloride	ND	0.010	0.0044	20.0	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	103	47-137	
Toluene-d8	100	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 11 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8430	N/A	Air	GC/MS II	N/A	04/06/18 15:39	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 12 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	97	47-137	
Toluene-d8	98	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 13 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8431	N/A	Air	GC/MS II	N/A	04/09/18 15:38	180409L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 14 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	97	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01368	18-04-0574-4-A	04/06/18 14:55	Air	GC/MS II	N/A	04/07/18 06:24	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	4000	23	80000	
Benzyl Chloride	ND	120	3.9	80000	
Bromodichloromethane	ND	40	5.0	80000	
Bromoform	ND	40	6.5	80000	
Bromomethane	ND	40	11	80000	
1,3-Butadiene	ND	120	27	80000	
2-Butanone	ND	120	35	80000	
Carbon Disulfide	ND	800	22	80000	
Carbon Tetrachloride	ND	40	4.9	80000	
Chlorobenzene	ND	40	5.4	80000	
Chloroethane	ND	40	19	80000	
Chloroform	ND	40	5.5	80000	
Chloromethane	ND	40	19	80000	
Cyclohexane	87	40	13	80000	
Dibromochloromethane	ND	40	4.4	80000	
Dichlorodifluoromethane	ND	40	4.8	80000	
Diisopropyl Ether (DIPE)	ND	160	5.2	80000	
1,1-Dichloroethane	ND	40	5.0	80000	
1,1-Dichloroethene	ND	40	16	80000	
1,2-Dibromoethane	ND	40	5.5	80000	
Dichlorotetrafluoroethane	ND	160	21	80000	
1,2-Dichlorobenzene	ND	40	4.2	80000	
1,2-Dichloroethane	ND	40	5.5	80000	
1,2-Dichloropropane	ND	40	15	80000	
1,3-Dichlorobenzene	ND	40	13	80000	
1,4-Dichlorobenzene	ND	40	5.4	80000	
1,4-Dioxane	ND	800	34	80000	
c-1,3-Dichloropropene	ND	40	5.2	80000	
c-1,2-Dichloroethene	ND	40	7.0	80000	
t-1,2-Dichloroethene	ND	40	10	80000	
t-1,3-Dichloropropene	ND	80	5.5	80000	
Ethanol	ND	4000	69	80000	
Ethyl Acetate	ND	800	49	80000	
Ethyl-t-Butyl Ether (ETBE)	ND	160	4.6	80000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethylbenzene	3000	40	12	80000	
4-Ethyltoluene	ND	40	13	80000	
Heptane	710	160	36	80000	
Hexachloro-1,3-Butadiene	ND	120	8.2	80000	
Hexane	25	160	13	80000	J
2-Hexanone	ND	120	35	80000	
Methyl-t-Butyl Ether (MTBE)	ND	160	12	80000	
Methylene Chloride	ND	400	20	80000	
4-Methyl-2-Pentanone	ND	120	30	80000	
o-Xylene	ND	40	13	80000	
p/m-Xylene	ND	160	27	80000	
Propene	ND	800	20	80000	
Styrene	ND	120	5.1	80000	
Tert-Amyl-Methyl Ether (TAME)	ND	160	3.9	80000	
Tert-Butyl Alcohol (TBA)	ND	400	14	80000	
Tetrachloroethene	ND	40	5.4	80000	
Tetrahydrofuran	ND	120	25	80000	
Toluene	110	400	11	80000	J
Trichloroethene	ND	40	5.6	80000	
Trichlorofluoromethane	ND	80	14	80000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	120	5.6	80000	
1,1,1-Trichloroethane	ND	40	6.3	80000	
1,1,2-Trichloroethane	ND	40	15	80000	
1,2,3-Trichloropropane	ND	400	6.2	80000	
Acrolein	ND	400	22	80000	
Acrylonitrile	ND	80	32	80000	
Methyl Methacrylate	ND	40	8.8	80000	
Propane	ND	1200	38	80000	
Butane	ND	400	38	80000	
Methanol	220	4000	110	80000	J
2,2,4-Trimethyl Pentane	ND	40	5.3	80000	
Isobutane	ND	400	48	80000	
1,1,1,2-Tetrafluoroethane	ND	160	5.8	80000	
1,3,5-Trimethylbenzene	ND	40	12	80000	
1,1,2,2-Tetrachloroethane	ND	80	11	80000	
1,2,4-Trimethylbenzene	ND	120	12	80000	
1,2,4-Trichlorobenzene	ND	160	9.9	80000	
Vinyl Acetate	ND	160	7.8	80000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Vinyl Chloride	ND	40	18	80000	
1,1-Difluoroethane	ND	160	7.5	80000	
Isopropanol	25	4000	20	80000	J
Isopropylbenzene	19	40	17	80000	J
Naphthalene	ND	400	13	80000	
n-Butylbenzene	ND	40	26	80000	
n-Propylbenzene	ND	40	21	80000	
p-Isopropyltoluene	ND	40	21	80000	
sec-Butylbenzene	ND	40	20	80000	
tert-Butylbenzene	ND	40	21	80000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	103	57-129	
1,2-Dichloroethane-d4	103	47-137	
Toluene-d8	102	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01368	18-04-0574-4-A	04/06/18 14:55	Air	GC/MS II	N/A	04/07/18 07:15	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	7600	100	17	200000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	99	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8430	N/A	Air	GC/MS II	N/A	04/06/18 15:39	180406L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
1,3-Butadiene	ND	0.0015	0.00033	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Cyclohexane	ND	0.00050	0.00016	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
Diisopropyl Ether (DIPE)	ND	0.0020	0.000065	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
1,4-Dioxane	ND	0.010	0.00042	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethanol	ND	0.050	0.00087	1.00	
Ethyl Acetate	ND	0.010	0.00061	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethyl-t-Butyl Ether (ETBE)	ND	0.0020	0.000057	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Heptane	ND	0.0020	0.00044	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
Hexane	ND	0.0020	0.00016	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Propene	ND	0.010	0.00025	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.0020	0.000049	1.00	
Tert-Butyl Alcohol (TBA)	ND	0.0050	0.00017	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Tetrahydrofuran	ND	0.0015	0.00031	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,2,3-Trichloropropane	ND	0.0050	0.000077	1.00	
Acrolein	ND	0.0050	0.00028	1.00	
Acrylonitrile	ND	0.0010	0.00040	1.00	
Methyl Methacrylate	ND	0.00050	0.00011	1.00	
Propane	ND	0.015	0.00047	1.00	
Butane	ND	0.0050	0.00048	1.00	
Methanol	ND	0.050	0.0013	1.00	
2,2,4-Trimethyl Pentane	ND	0.00050	0.000067	1.00	
Isobutane	ND	0.0050	0.00060	1.00	
1,1,1,2-Tetrafluoroethane	ND	0.0020	0.000073	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	
1,1-Difluoroethane	ND	0.0020	0.000093	1.00	
Isopropanol	ND	0.050	0.00025	1.00	
Isopropylbenzene	ND	0.00050	0.00022	1.00	
Naphthalene	ND	0.0050	0.00016	1.00	
n-Butylbenzene	ND	0.00050	0.00033	1.00	
n-Propylbenzene	ND	0.00050	0.00027	1.00	
sec-Butylbenzene	ND	0.00050	0.00025	1.00	
tert-Butylbenzene	ND	0.00050	0.00026	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>		
1,4-Bromofluorobenzene	97	57-129			
1,2-Dichloroethane-d4	97	47-137			
Toluene-d8	98	78-156			



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01366	18-04-0574-1-A	04/05/18 12:00	Air	GC 13	N/A	04/06/18 21:31	180406L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	1700	10	2.1	5.00	

VSS01365	18-04-0574-2-A	04/05/18 12:01	Air	GC 13	N/A	04/06/18 21:41	180406L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	13000	100	21	50.0	

VSS01367	18-04-0574-3-A	04/05/18 12:05	Air	GC 13	N/A	04/06/18 20:57	180406L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	6.7	2.0	0.43	1.00	

VSS01368	18-04-0574-4-A	04/06/18 14:55	Air	GC 13	N/A	04/06/18 21:52	180406L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	19000	200	43	100	

VSS01369	18-04-0574-5-A	04/06/18 15:00	Air	GC 13	N/A	04/06/18 22:02	180406L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	1600	20	4.3	10.0	

VSS01370	18-04-0574-6-A	04/06/18 15:05	Air	GC 13	N/A	04/06/18 21:07	180406L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	8.4	2.0	0.43	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	098-01-005-8397	N/A	Air	GC 13	N/A	04/06/18 10:02	180406L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	ND	2.0	0.43	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01366	18-04-0574-1-A	04/05/18 12:00	Air	GC 14	N/A	04/07/18 11:09	180407L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	26	1.0	0.21	1.00	

VSS01365	18-04-0574-2-A	04/05/18 12:01	Air	GC 14	N/A	04/07/18 11:52	180407L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	260	1.0	0.21	1.00	

VSS01368	18-04-0574-4-A	04/06/18 14:55	Air	GC 14	N/A	04/07/18 12:38	180407L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	250	1.0	0.21	1.00	

VSS01369	18-04-0574-5-A	04/06/18 15:00	Air	GC 14	N/A	04/07/18 13:25	180407L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	23	1.0	0.21	1.00	

Method Blank	099-07-024-1540	N/A	Air	GC 14	N/A	04/07/18 10:49	180407L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	ND	1.0	0.21	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/06/18 Work Order: 18-04-0574 Preparation: N/A Method: EPA TO-3M Page 1 of 1
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
18-04-0418-2	Sample	Air	GC 13	N/A	04/06/18 13:20	180406D01
18-04-0418-2	Sample Duplicate	Air	GC 13	N/A	04/06/18 13:35	180406D01
<u>Parameter</u>	<u>Sample Conc.</u>		<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	2.998		3.006	0	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-762	LCS	Air	GC 65	N/A	04/07/18 09:39	180407L01			
099-16-444-762	LCSD	Air	GC 65	N/A	04/07/18 09:58	180407L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	15.00	100	16.39	109	80-120	9	0-30	
Carbon Monoxide	7.020	6.798	97	7.280	104	80-120	7	0-30	
Oxygen (+ Argon)	3.990	3.918	98	4.126	103	80-120	5	0-30	
Nitrogen	69.45	65.16	94	69.32	100	80-120	6	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-12-981-8430	LCS	Air	GC/MS II	N/A	04/06/18 12:19	180406L02				
099-12-981-8430	LCSD	Air	GC/MS II	N/A	04/06/18 13:09	180406L02				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02279	91	0.02350	94	50-150	33-167	3	0-35	
Benzene	0.02500	0.02373	95	0.02394	96	60-156	44-172	1	0-40	
Benzyl Chloride	0.02500	0.02449	98	0.02466	99	50-150	33-167	1	0-35	
Bromodichloromethane	0.02500	0.02410	96	0.02437	97	50-150	33-167	1	0-35	
Bromoform	0.02500	0.02484	99	0.02512	100	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02347	94	0.02379	95	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.02272	91	0.02310	92	50-150	33-167	2	0-35	
Carbon Disulfide	0.02500	0.02235	89	0.02271	91	50-150	33-167	2	0-35	
Carbon Tetrachloride	0.02500	0.02498	100	0.02524	101	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02542	102	0.02542	102	50-150	33-167	0	0-35	
Chloroethane	0.02500	0.02493	100	0.02478	99	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02326	93	0.02347	94	50-150	33-167	1	0-35	
Chloromethane	0.02500	0.02330	93	0.02617	105	50-150	33-167	12	0-35	
Dibromochloromethane	0.02500	0.02448	98	0.02475	99	50-150	33-167	1	0-35	
Dichlorodifluoromethane	0.02500	0.02373	95	0.02398	96	50-150	33-167	1	0-35	
Diisopropyl Ether (DIPE)	0.02500	0.02042	82	0.02060	82	60-140	47-153	1	0-30	
1,1-Dichloroethane	0.02500	0.02320	93	0.02357	94	50-150	33-167	2	0-35	
1,1-Dichloroethene	0.02500	0.02410	96	0.02431	97	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02483	99	0.02489	100	54-144	39-159	0	0-36	
Dichlorotetrafluoroethane	0.02500	0.02487	99	0.02497	100	50-150	33-167	0	0-35	
1,2-Dichlorobenzene	0.02500	0.02486	99	0.02502	100	34-160	13-181	1	0-47	
1,2-Dichloroethane	0.02500	0.02336	93	0.02370	95	69-153	55-167	1	0-35	
1,2-Dichloropropane	0.02500	0.02417	97	0.02447	98	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02455	98	0.02475	99	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02489	100	0.02509	100	36-156	16-176	1	0-47	
1,4-Dioxane	0.02500	0.02518	101	0.02525	101	50-150	33-167	0	0-30	
c-1,3-Dichloropropene	0.02500	0.02601	104	0.02633	105	61-157	45-173	1	0-35	
c-1,2-Dichloroethene	0.02500	0.02473	99	0.02504	100	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02426	97	0.02451	98	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02626	105	0.02678	107	50-150	33-167	2	0-35	
Ethanol	0.1000	0.09038	90	0.08136	81	60-140	47-153	11	0-30	
Ethyl-t-Butyl Ether (ETBE)	0.02500	0.02243	90	0.02271	91	60-140	47-153	1	0-30	
Ethylbenzene	0.02500	0.02547	102	0.02570	103	52-154	35-171	1	0-38	
4-Ethyltoluene	0.02500	0.02549	102	0.02579	103	50-150	33-167	1	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02542	102	0.02618	105	50-150	33-167	3	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 9

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
2-Hexanone	0.02500	0.02507	100	0.02536	101	50-150	33-167	1	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02446	98	0.02456	98	50-150	33-167	0	0-35	
Methylene Chloride	0.02500	0.02493	100	0.02507	100	50-150	33-167	1	0-35	
4-Methyl-2-Pentanone	0.02500	0.02566	103	0.02599	104	50-150	33-167	1	0-35	
Naphthalene	0.02500	0.02688	108	0.02708	108	40-190	15-215	1	0-30	
o-Xylene	0.02500	0.02410	96	0.02428	97	52-148	36-164	1	0-38	
p/m-Xylene	0.05000	0.04908	98	0.04954	99	42-156	23-175	1	0-41	
Styrene	0.02500	0.02501	100	0.02531	101	50-150	33-167	1	0-35	
Tert-Amyl-Methyl Ether (TAME)	0.02500	0.02349	94	0.02346	94	60-140	47-153	0	0-30	
Tert-Butyl Alcohol (TBA)	0.05000	0.04803	96	0.04818	96	60-140	47-153	0	0-30	
Tetrachloroethene	0.02500	0.02484	99	0.02504	100	56-152	40-168	1	0-40	
Toluene	0.02500	0.02359	94	0.02364	95	56-146	41-161	0	0-43	
Trichloroethene	0.02500	0.02500	100	0.02526	101	63-159	47-175	1	0-34	
Trichlorofluoromethane	0.02500	0.02275	91	0.02387	95	50-150	33-167	5	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02373	95	0.02412	96	50-150	33-167	2	0-35	
1,1,1-Trichloroethane	0.02500	0.02416	97	0.02443	98	50-150	33-167	1	0-35	
1,1,2-Trichloroethane	0.02500	0.02475	99	0.02497	100	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02547	102	0.02566	103	50-150	33-167	1	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02396	96	0.02415	97	50-150	33-167	1	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02492	100	0.02504	100	50-150	33-167	0	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02819	113	0.02872	115	50-150	33-167	2	0-35	
Vinyl Acetate	0.02500	0.02182	87	0.02208	88	50-150	33-167	1	0-35	
Vinyl Chloride	0.02500	0.02364	95	0.02359	94	45-177	23-199	0	0-36	
1,1-Difluoroethane	0.02500	0.02439	98	0.02384	95	60-140	47-153	2	0-30	
Isopropanol	0.02500	0.02158	86	0.02038	82	50-150	33-167	6	0-30	

Total number of LCS compounds: 60

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8430	LCS	Air	GC/MS II	N/A	04/06/18 12:19	180406L02	
099-12-981-8430	LCSD	Air	GC/MS II	N/A	04/06/18 13:09	180406L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02414	97	0.02411	96	57-129	
1,2-Dichloroethane-d4	0.02500	0.02347	94	0.02372	95	47-137	
Toluene-d8	0.02500	0.02487	99	0.02519	101	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8431	LCS	Air	GC/MS II	N/A	04/09/18 12:59	180409L02
099-12-981-8431	LCSD	Air	GC/MS II	N/A	04/09/18 13:57	180409L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02793	112	0.03480	139	50-150	33-167	22	0-35	
Benzene	0.02500	0.02494	100	0.02423	97	60-156	44-172	3	0-40	
Benzyl Chloride	0.02500	0.03056	122	0.02646	106	50-150	33-167	14	0-35	
Bromodichloromethane	0.02500	0.02656	106	0.02587	103	50-150	33-167	3	0-35	
Bromoform	0.02500	0.02758	110	0.02783	111	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02603	104	0.03121	125	50-150	33-167	18	0-35	
2-Butanone	0.02500	0.02574	103	0.02215	89	50-150	33-167	15	0-35	
Carbon Disulfide	0.02500	0.02357	94	0.02253	90	50-150	33-167	5	0-35	
Carbon Tetrachloride	0.02500	0.02779	111	0.02783	111	64-154	49-169	0	0-32	
Chlorobenzene	0.02500	0.02705	108	0.02668	107	50-150	33-167	1	0-35	
Chloroethane	0.02500	0.02679	107	0.03346	134	50-150	33-167	22	0-35	
Chloroform	0.02500	0.02554	102	0.02462	98	50-150	33-167	4	0-35	
Chloromethane	0.02500	0.02599	104	0.03248	130	50-150	33-167	22	0-35	
Dibromochloromethane	0.02500	0.02640	106	0.02733	109	50-150	33-167	3	0-35	
Dichlorodifluoromethane	0.02500	0.02630	105	0.03176	127	50-150	33-167	19	0-35	
1,1-Dichloroethane	0.02500	0.02484	99	0.02366	95	50-150	33-167	5	0-35	
1,1-Dichloroethene	0.02500	0.02705	108	0.02406	96	50-150	33-167	12	0-35	
1,2-Dibromoethane	0.02500	0.02620	105	0.02663	107	54-144	39-159	2	0-36	
Dichlorotetrafluoroethane	0.02500	0.02675	107	0.03243	130	50-150	33-167	19	0-35	
1,2-Dichlorobenzene	0.02500	0.02910	116	0.02709	108	34-160	13-181	7	0-47	
1,2-Dichloroethane	0.02500	0.02650	106	0.02528	101	69-153	55-167	5	0-35	
1,2-Dichloropropane	0.02500	0.02643	106	0.02438	98	67-157	52-172	8	0-35	
1,3-Dichlorobenzene	0.02500	0.02948	118	0.02684	107	50-150	33-167	9	0-35	
1,4-Dichlorobenzene	0.02500	0.02895	116	0.02703	108	36-156	16-176	7	0-47	
c-1,3-Dichloropropene	0.02500	0.02838	114	0.02681	107	61-157	45-173	6	0-35	
c-1,2-Dichloroethene	0.02500	0.02608	104	0.02523	101	50-150	33-167	3	0-35	
t-1,2-Dichloroethene	0.02500	0.02547	102	0.02496	100	50-150	33-167	2	0-35	
t-1,3-Dichloropropene	0.02500	0.02917	117	0.02767	111	50-150	33-167	5	0-35	
Ethylbenzene	0.02500	0.02762	110	0.02661	106	52-154	35-171	4	0-38	
4-Ethyltoluene	0.02500	0.02928	117	0.02717	109	50-150	33-167	7	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02958	118	0.03056	122	50-150	33-167	3	0-35	
2-Hexanone	0.02500	0.02738	110	0.02611	104	50-150	33-167	5	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02595	104	0.02536	101	50-150	33-167	2	0-35	
Methylene Chloride	0.02500	0.02623	105	0.02346	94	50-150	33-167	11	0-35	
4-Methyl-2-Pentanone	0.02500	0.02878	115	0.02579	103	50-150	33-167	11	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 9

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02880	115	0.02547	102	52-148	36-164	12	0-38	
p/m-Xylene	0.05000	0.05482	110	0.05232	105	42-156	23-175	5	0-41	
Styrene	0.02500	0.02912	116	0.02606	104	50-150	33-167	11	0-35	
Tetrachloroethene	0.02500	0.02637	105	0.02749	110	56-152	40-168	4	0-40	
Toluene	0.02500	0.02468	99	0.02471	99	56-146	41-161	0	0-43	
Trichloroethene	0.02500	0.02707	108	0.02630	105	63-159	47-175	3	0-34	
Trichlorofluoromethane	0.02500	0.02711	108	0.03215	129	50-150	33-167	17	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02534	101	0.02458	98	50-150	33-167	3	0-35	
1,1,1-Trichloroethane	0.02500	0.02686	107	0.02636	105	50-150	33-167	2	0-35	
1,1,2-Trichloroethane	0.02500	0.02714	109	0.02517	101	65-149	51-163	8	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02957	118	0.02727	109	50-150	33-167	8	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02988	120	0.02441	98	50-150	33-167	20	0-35	
1,2,4-Trimethylbenzene	0.02500	0.03007	120	0.02678	107	50-150	33-167	12	0-35	
1,2,4-Trichlorobenzene	0.02500	0.03232	129	0.03322	133	50-150	33-167	3	0-35	
Vinyl Acetate	0.02500	0.02473	99	0.02206	88	50-150	33-167	11	0-35	
Vinyl Chloride	0.02500	0.02638	106	0.03408	136	45-177	23-199	25	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8431	LCS	Air	GC/MS II	N/A	04/09/18 12:59	180409L02	
099-12-981-8431	LCSD	Air	GC/MS II	N/A	04/09/18 13:57	180409L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02697	108	0.02362	94	57-129	
1,2-Dichloroethane-d4	0.02500	0.02499	100	0.02444	98	47-137	
Toluene-d8	0.02500	0.02539	102	0.02462	98	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: EPA TO-3M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8397	LCS	Air	GC 13	N/A	04/06/18 09:40	180406L01
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	192.5	96	80-120	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/06/18
Work Order: 18-04-0574
Preparation: N/A
Method: SCAQMD 25.1M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 9

Quality Control Sample ID	Type	Matrix		Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1540	LCS	Air		GC 14	N/A	04/07/18 10:01	180407L02			
099-07-024-1540	LCSD	Air		GC 14	N/A	04/07/18 10:24	180407L02			
Parameter	Spike Added	LCS	Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	101.0	105.0		104	104.8	104	80-120	0	0-20	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Sample Analysis Summary Report

Work Order: 18-04-0574

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	1145	GC 65	2
EPA TO-15M	N/A	866	GC/MS II	2
EPA TO-3M	N/A	1145	GC 13	2
SCAQMD 25.1M	N/A	1144	GC 14	2

Glossary of Terms and Qualifiers

Work Order: 18-04-0574

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Erick Ovalle

From: Pittman, Margaret <Margaret.Pittman@aecom.com>
Sent: Monday, April 09, 2018 3:02 PM
To: Erick Ovalle
Cc: Doane-Allmon, Julie; Vikas Patel; Francis, Jude; Grasmick, Daniel
Subject: Re: Del Amo Superfund / 18-04-0574 - Response requested

EXTERNAL EMAIL *

Please analyze outside holding time and flag the results accordingly. Thanks!

Sent from my iPhone

On Apr 9, 2018, at 2:21 PM, Erick Ovalle <ErickOvalle@eurofinsUS.com> wrote:

Margaret,

Sample VSS01367 was not logged in for TO-15 due to laboratory oversight and is now outside holding time. Please advise if you would like us to analyze outside holding time or if you would like to re-collect?

I attempted to call your office and direct numbers but they all have a busy tone.

Best Regards,
Erick Ovalle
Project Manager Assistant

Eurofins Calscience
7440 Lincoln Way
Garden Grove, CA 92841-1427
USA
Phone: +1 (714) 895-5494

Email: ErickOvalle@eurofinsus.com
Website: www.eurofinsUS.com/Calscience

<image001.jpg>

<18-04-0574.PDF>

Notify us [here](#) to report this email as spam.

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SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: Aecom

DATE: 04/6/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): _____°C (w/ CF): _____°C; ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☒ Air ☐ Filter

Checked by: 1091

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☐ Not Present ☒ N/A

Checked by: 1091

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A

Checked by: 1053

SAMPLE CONDITION:

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH__9)
☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH__2) ☐ 250PB ☐ 250PB_n (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s (pH__2) ☐ 500PB
☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s (pH__2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH__12) ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____

Air: ☒ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 1053

s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, znna = Zn (CH₃CO₂)₂ + NaOH Reviewed by: 1091



WORK ORDER NUMBER: 18-04-0819

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: AECOM

Client Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Attention: Julie Doane-Allmon
130 Robin Hill Road
Suite 100
Santa Barbara, CA 93117-3153

Vikas Patel

Approved for release on 05/03/2018 by:
Vikas Patel
Project Manager

ResultLink ▶

Email your PM ▶

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Contents

Client Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
 Work Order Number: 18-04-0819

1	Work Order Narrative.	3
2	Sample Summary.	4
3	QC Association Summary.	5
4	Detections Summary.	7
5	Client Sample Data.	11
	5.1 ASTM D-1946 Fixed Gases (Air).	11
	5.2 EPA TO-15 (M) Full List (Air).	15
	5.3 EPA TO-3 (M) TPH Gasoline (Air).	43
	5.4 SCAQMD 25.1 TGNMO and CH4 (Air).	46
6	Quality Control Sample Data.	49
	6.1 Sample Duplicate.	49
	6.2 LCS/LCSD.	50
7	Sample Analysis Summary.	59
8	Glossary of Terms and Qualifiers.	60
9	Chain-of-Custody/Sample Receipt Form.	61

Work Order Narrative

Work Order: 18-04-0819

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/10/18. They were assigned to Work Order 18-04-0819.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



Calscience

Sample Summary

Client: AECOM	Work Order: 18-04-0819
130 Robin Hill Road, Suite 100	Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Santa Barbara, CA 93117-3153	PO Number: 100067
	Date/Time Received: 04/10/18 18:10
	Number of Containers: 13

Attn: Julie Doane-Allmon

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VSS01371	18-04-0819-1	04/09/18 08:35	1	Air
VSS01372	18-04-0819-2	04/09/18 08:33	1	Air
VSS01373	18-04-0819-3	04/09/18 10:05	1	Air
VSS01374	18-04-0819-4	04/09/18 10:05	1	Air
VSS01375	18-04-0819-5	04/09/18 12:25	1	Air
VSS01376	18-04-0819-6	04/09/18 12:20	1	Air
VSS01377	18-04-0819-7	04/09/18 13:15	1	Air
VSS01378	18-04-0819-8	04/09/18 13:17	1	Air
VSS01379	18-04-0819-9	04/09/18 14:15	1	Air
VSS01380	18-04-0819-10	04/09/18 14:20	1	Air
VSS01381	18-04-0819-11	04/09/18 16:15	1	Air
VSS01382	18-04-0819-12	04/09/18 16:20	1	Air
VSS01383	18-04-0819-13	04/09/18 16:25	1	Air

Return to Contents

QC Association Summary

Work Order: 18-04-0819

Page 1 of 2

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01371	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01371	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01371	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01371	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01372	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01372	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01372	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01372	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01373	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01373	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01373	EPA TO-15 (M) Full List	R	N/A	GC/MS OOO	*1	180412L02
VSS01373	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01373	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01374	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01374	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01374	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01374	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01375	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01375	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01375	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01375	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01376	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01376	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01376	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01376	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01377	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01377	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01377	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01377	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01378	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01378	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01378	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01378	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01379	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01379	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01379	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01379	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01380	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01380	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01380	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01380	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01381	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01381	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun

QC Association Summary

Work Order: 18-04-0819

Page 2 of 2

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01381	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01381	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01382	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180411L02
VSS01382	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01382	EPA TO-15 (M) Full List	R	N/A	GC/MS OOO	*1	180412L02
VSS01382	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01
VSS01382	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180417L02
VSS01383	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180411L02
VSS01383	EPA TO-15 (M) Full List	R	N/A	GC/MS OOO	*1	180412L02
VSS01383	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180411D01	180411L01

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun



Calscience

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0819
Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Received: 04/10/18

Attn: Julie Doane-Allmon

Page 1 of 4

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01371 (18-04-0819-1)						
Carbon Dioxide	6.44		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	14.1		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.5		0.500	%v	ASTM D-1946	N/A
Acetone	21	J	11*	ppm (v/v)	EPA TO-15M	N/A
Benzene	3600		20	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1100		20	ppm (v/v)	EPA TO-15M	N/A
Toluene	39	J	5.4*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	5700		30	ppm (v/v)	EPA TO-3M	N/A
Methane	120		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01372 (18-04-0819-2)						
Carbon Dioxide	16.3		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.42		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.2		0.500	%v	ASTM D-1946	N/A
Benzene	8700		62	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2800		62	ppm (v/v)	EPA TO-15M	N/A
Toluene	74	J	17*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	17000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	290		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01373 (18-04-0819-3)						
Carbon Dioxide	7.29		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	13.1		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.6		0.500	%v	ASTM D-1946	N/A
Acetone	1.3	J	0.23*	ppm (v/v)	EPA TO-15M	N/A
Benzene	1100	E	0.40	ppm (v/v)	EPA TO-15M	N/A
Benzene	3100		40	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	660	E	0.40	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	870		40	ppm (v/v)	EPA TO-15M	N/A
4-Ethyltoluene	0.37	J	0.13*	ppm (v/v)	EPA TO-15M	N/A
o-Xylene	0.20	J	0.13*	ppm (v/v)	EPA TO-15M	N/A
p/m-Xylene	0.38	J	0.27*	ppm (v/v)	EPA TO-15M	N/A
Styrene	0.16	J	0.051*	ppm (v/v)	EPA TO-15M	N/A
Toluene	49		4.0	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	9400		75	ppm (v/v)	EPA TO-3M	N/A
Methane	130		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



Calscience

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0819
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/10/18

Attn: Julie Doane-Allmon

Page 2 of 4

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01374 (18-04-0819-4)						
Carbon Dioxide	16.1		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.55		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.4		0.500	%v	ASTM D-1946	N/A
Benzene	8900		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3000		80	ppm (v/v)	EPA TO-15M	N/A
Toluene	82	J	22*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	19000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	290		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01375 (18-04-0819-5)						
Carbon Dioxide	9.86		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	9.95		0.500	%v	ASTM D-1946	N/A
Nitrogen	80.2		0.500	%v	ASTM D-1946	N/A
Benzene	5700		50	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2700		50	ppm (v/v)	EPA TO-15M	N/A
Toluene	56	J	13*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	12000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	200		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01376 (18-04-0819-6)						
Carbon Dioxide	15.9		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.53		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.5		0.500	%v	ASTM D-1946	N/A
Acetone	48	J	46*	ppm (v/v)	EPA TO-15M	N/A
Benzene	7700		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2200		80	ppm (v/v)	EPA TO-15M	N/A
Toluene	65	J	22*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	18000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	280		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01377 (18-04-0819-7)						
Carbon Dioxide	8.66		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	11.4		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.9		0.500	%v	ASTM D-1946	N/A
Acetone	30	J	23*	ppm (v/v)	EPA TO-15M	N/A
Benzene	5100		40	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2600		40	ppm (v/v)	EPA TO-15M	N/A
Toluene	55	J	11*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	11000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	170		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



Calscience

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0819
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/10/18

Attn: Julie Doane-Allmon

Page 3 of 4

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01378 (18-04-0819-8)						
Carbon Dioxide	15.8		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.61		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.6		0.500	%v	ASTM D-1946	N/A
Benzene	6900		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2700		80	ppm (v/v)	EPA TO-15M	N/A
Toluene	60	J	22*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	19000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	350		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01379 (18-04-0819-9)						
Carbon Dioxide	8.34		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	11.8		0.500	%v	ASTM D-1946	N/A
Nitrogen	79.8		0.500	%v	ASTM D-1946	N/A
Acetone	40	J	23*	ppm (v/v)	EPA TO-15M	N/A
Benzene	4600		40	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2100		40	ppm (v/v)	EPA TO-15M	N/A
Toluene	44	J	11*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	11000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	130		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01380 (18-04-0819-10)						
Carbon Dioxide	16.0		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	2.61		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.4		0.500	%v	ASTM D-1946	N/A
Benzene	8300		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3000		80	ppm (v/v)	EPA TO-15M	N/A
Toluene	70	J	22*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	18000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	330		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01381 (18-04-0819-11)						
Carbon Dioxide	15.9		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	3.04		0.500	%v	ASTM D-1946	N/A
Nitrogen	81.1		0.500	%v	ASTM D-1946	N/A
Benzene	7900		80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	2700		80	ppm (v/v)	EPA TO-15M	N/A
Toluene	63	J	22*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	17000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	250		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



Calscience

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-0819
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/10/18

Attn: Julie Doane-Allmon

Page 4 of 4

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01382 (18-04-0819-12)						
Oxygen (+ Argon)	21.4		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.5		0.500	%v	ASTM D-1946	N/A
Acetone	0.35	J	0.11*	ppm (v/v)	EPA TO-15M	N/A
Benzene	17		0.20	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	51	E	0.20	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	39		0.50	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.53	J	0.054*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	110		1.5	ppm (v/v)	EPA TO-3M	N/A
Methane	0.82	J	0.21*	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01383 (18-04-0819-13)						
Acetone	0.53	J	0.18*	ppm (v/v)	EPA TO-15M	N/A
Benzene	33		0.31	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	110	E	0.31	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	82		1.2	ppm (v/v)	EPA TO-15M	N/A
Toluene	1.0	J	0.084*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	170		1.5	ppm (v/v)	EPA TO-3M	N/A

Subcontracted analyses, if any, are not included in this summary.

* MDL is shown



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01371	18-04-0819-1-A	04/09/18 08:35	Air	GC 65	N/A	04/11/18 12:32	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	6.44	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	14.1	0.500	0.205	1.00	
Nitrogen	79.5	0.500	0.477	1.00	

VSS01372	18-04-0819-2-A	04/09/18 08:33	Air	GC 65	N/A	04/11/18 13:20	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	16.3	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.42	0.500	0.205	1.00	
Nitrogen	81.2	0.500	0.477	1.00	

VSS01373	18-04-0819-3-A	04/09/18 10:05	Air	GC 65	N/A	04/11/18 13:40	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.29	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	13.1	0.500	0.205	1.00	
Nitrogen	79.6	0.500	0.477	1.00	

VSS01374	18-04-0819-4-A	04/09/18 10:05	Air	GC 65	N/A	04/11/18 14:00	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	16.1	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.55	0.500	0.205	1.00	
Nitrogen	81.4	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01375	18-04-0819-5-A	04/09/18 12:25	Air	GC 65	N/A	04/11/18 14:19	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	9.86	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	9.95	0.500	0.205	1.00	
Nitrogen	80.2	0.500	0.477	1.00	

VSS01376	18-04-0819-6-A	04/09/18 12:20	Air	GC 65	N/A	04/11/18 14:41	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	15.9	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.53	0.500	0.205	1.00	
Nitrogen	81.5	0.500	0.477	1.00	

VSS01377	18-04-0819-7-A	04/09/18 13:15	Air	GC 65	N/A	04/11/18 14:59	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	8.66	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	11.4	0.500	0.205	1.00	
Nitrogen	79.9	0.500	0.477	1.00	

VSS01378	18-04-0819-8-A	04/09/18 13:17	Air	GC 65	N/A	04/11/18 18:17	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	15.8	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.61	0.500	0.205	1.00	
Nitrogen	81.6	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01379	18-04-0819-9-A	04/09/18 14:15	Air	GC 65	N/A	04/11/18 17:31	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	8.34	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	11.8	0.500	0.205	1.00	
Nitrogen	79.8	0.500	0.477	1.00	

VSS01380	18-04-0819-10-A	04/09/18 14:20	Air	GC 65	N/A	04/11/18 17:50	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	16.0	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	2.61	0.500	0.205	1.00	
Nitrogen	81.4	0.500	0.477	1.00	

VSS01381	18-04-0819-11-A	04/09/18 16:15	Air	GC 65	N/A	04/11/18 18:44	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	15.9	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	3.04	0.500	0.205	1.00	
Nitrogen	81.1	0.500	0.477	1.00	

VSS01382	18-04-0819-12-A	04/09/18 16:20	Air	GC 65	N/A	04/11/18 19:12	180411L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	21.4	0.500	0.205	1.00	
Nitrogen	78.5	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-16-444-764	N/A	Air	GC 65	N/A	04/11/18 10:42	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01371	18-04-0819-1-A	04/09/18 08:35	Air	GC/MS OOO	N/A	04/11/18 18:28	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	21	2000	11	40000	J
Benzene	3600	20	3.4	40000	
Benzyl Chloride	ND	60	2.0	40000	
Bromodichloromethane	ND	20	2.5	40000	
Bromoform	ND	20	3.2	40000	
Bromomethane	ND	20	5.5	40000	
2-Butanone	ND	60	17	40000	
Carbon Disulfide	ND	400	11	40000	
Carbon Tetrachloride	ND	20	2.5	40000	
Chlorobenzene	ND	20	2.7	40000	
Chloroethane	ND	20	9.6	40000	
Chloroform	ND	20	2.8	40000	
Chloromethane	ND	20	9.6	40000	
Dibromochloromethane	ND	20	2.2	40000	
Dichlorodifluoromethane	ND	20	2.4	40000	
1,1-Dichloroethane	ND	20	2.5	40000	
1,1-Dichloroethene	ND	20	8.0	40000	
1,2-Dibromoethane	ND	20	2.8	40000	
Dichlorotetrafluoroethane	ND	80	11	40000	
1,2-Dichlorobenzene	ND	20	2.1	40000	
1,2-Dichloroethane	ND	20	2.7	40000	
1,2-Dichloropropane	ND	20	7.6	40000	
1,3-Dichlorobenzene	ND	20	6.5	40000	
1,4-Dichlorobenzene	ND	20	2.7	40000	
c-1,3-Dichloropropene	ND	20	2.6	40000	
c-1,2-Dichloroethene	ND	20	3.5	40000	
t-1,2-Dichloroethene	ND	20	5.1	40000	
t-1,3-Dichloropropene	ND	40	2.8	40000	
Ethylbenzene	1100	20	5.8	40000	
4-Ethyltoluene	ND	20	6.4	40000	
Hexachloro-1,3-Butadiene	ND	60	4.1	40000	
2-Hexanone	ND	60	18	40000	
Methyl-t-Butyl Ether (MTBE)	ND	80	6.1	40000	
Methylene Chloride	ND	200	9.9	40000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	60	15	40000	
o-Xylene	ND	20	6.3	40000	
p/m-Xylene	ND	80	13	40000	
Styrene	ND	60	2.5	40000	
Tetrachloroethene	ND	20	2.7	40000	
Toluene	39	200	5.4	40000	J
Trichloroethene	ND	20	2.8	40000	
Trichlorofluoromethane	ND	40	6.8	40000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	60	2.8	40000	
1,1,1-Trichloroethane	ND	20	3.2	40000	
1,1,2-Trichloroethane	ND	20	7.3	40000	
1,3,5-Trimethylbenzene	ND	20	5.8	40000	
1,1,2,2-Tetrachloroethane	ND	40	5.5	40000	
1,2,4-Trimethylbenzene	ND	60	6.1	40000	
1,2,4-Trichlorobenzene	ND	80	5.0	40000	
Vinyl Acetate	ND	80	3.9	40000	
Vinyl Chloride	ND	20	8.9	40000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	106	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	94	78-156	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01372	18-04-0819-2-A	04/09/18 08:33	Air	GC/MS OOO	N/A	04/11/18 19:12	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	6200	36	125000	
Benzene	8700	62	11	125000	
Benzyl Chloride	ND	190	6.1	125000	
Bromodichloromethane	ND	62	7.7	125000	
Bromoform	ND	62	10	125000	
Bromomethane	ND	62	17	125000	
2-Butanone	ND	190	54	125000	
Carbon Disulfide	ND	1200	35	125000	
Carbon Tetrachloride	ND	62	7.7	125000	
Chlorobenzene	ND	62	8.5	125000	
Chloroethane	ND	62	30	125000	
Chloroform	ND	62	8.7	125000	
Chloromethane	ND	62	30	125000	
Dibromochloromethane	ND	62	6.8	125000	
Dichlorodifluoromethane	ND	62	7.4	125000	
1,1-Dichloroethane	ND	62	7.9	125000	
1,1-Dichloroethene	ND	62	25	125000	
1,2-Dibromoethane	ND	62	8.6	125000	
Dichlorotetrafluoroethane	ND	250	33	125000	
1,2-Dichlorobenzene	ND	62	6.6	125000	
1,2-Dichloroethane	ND	62	8.6	125000	
1,2-Dichloropropane	ND	62	24	125000	
1,3-Dichlorobenzene	ND	62	20	125000	
1,4-Dichlorobenzene	ND	62	8.4	125000	
c-1,3-Dichloropropene	ND	62	8.2	125000	
c-1,2-Dichloroethene	ND	62	11	125000	
t-1,2-Dichloroethene	ND	62	16	125000	
t-1,3-Dichloropropene	ND	120	8.7	125000	
Ethylbenzene	2800	62	18	125000	
4-Ethyltoluene	ND	62	20	125000	
Hexachloro-1,3-Butadiene	ND	190	13	125000	
2-Hexanone	ND	190	55	125000	
Methyl-t-Butyl Ether (MTBE)	ND	250	19	125000	
Methylene Chloride	ND	620	31	125000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	190	47	125000	
o-Xylene	ND	62	20	125000	
p/m-Xylene	ND	250	42	125000	
Styrene	ND	190	8.0	125000	
Tetrachloroethene	ND	62	8.4	125000	
Toluene	74	620	17	125000	J
Trichloroethene	ND	62	8.7	125000	
Trichlorofluoromethane	ND	120	21	125000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	190	8.8	125000	
1,1,1-Trichloroethane	ND	62	9.9	125000	
1,1,2-Trichloroethane	ND	62	23	125000	
1,3,5-Trimethylbenzene	ND	62	18	125000	
1,1,2,2-Tetrachloroethane	ND	120	17	125000	
1,2,4-Trimethylbenzene	ND	190	19	125000	
1,2,4-Trichlorobenzene	ND	250	16	125000	
Vinyl Acetate	ND	250	12	125000	
Vinyl Chloride	ND	62	28	125000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	100	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01373	18-04-0819-3-A	04/09/18 10:05	Air	GC/MS OOO	N/A	04/11/18 19:56	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	1.3	40	0.23	800	J
Benzene	1100	0.40	0.068	800	E
Benzyl Chloride	ND	1.2	0.039	800	
Bromodichloromethane	ND	0.40	0.050	800	
Bromoform	ND	0.40	0.065	800	
Bromomethane	ND	0.40	0.11	800	
2-Butanone	ND	1.2	0.35	800	
Carbon Disulfide	ND	8.0	0.22	800	
Carbon Tetrachloride	ND	0.40	0.049	800	
Chlorobenzene	ND	0.40	0.054	800	
Chloroethane	ND	0.40	0.19	800	
Chloroform	ND	0.40	0.055	800	
Chloromethane	ND	0.40	0.19	800	
Dibromochloromethane	ND	0.40	0.044	800	
Dichlorodifluoromethane	ND	0.40	0.048	800	
1,1-Dichloroethane	ND	0.40	0.050	800	
1,1-Dichloroethene	ND	0.40	0.16	800	
1,2-Dibromoethane	ND	0.40	0.055	800	
Dichlorotetrafluoroethane	ND	1.6	0.21	800	
1,2-Dichlorobenzene	ND	0.40	0.042	800	
1,2-Dichloroethane	ND	0.40	0.055	800	
1,2-Dichloropropane	ND	0.40	0.15	800	
1,3-Dichlorobenzene	ND	0.40	0.13	800	
1,4-Dichlorobenzene	ND	0.40	0.054	800	
c-1,3-Dichloropropene	ND	0.40	0.052	800	
c-1,2-Dichloroethene	ND	0.40	0.070	800	
t-1,2-Dichloroethene	ND	0.40	0.10	800	
t-1,3-Dichloropropene	ND	0.80	0.055	800	
Ethylbenzene	660	0.40	0.12	800	E
4-Ethyltoluene	0.37	0.40	0.13	800	J
Hexachloro-1,3-Butadiene	ND	1.2	0.082	800	
2-Hexanone	ND	1.2	0.35	800	
Methyl-t-Butyl Ether (MTBE)	ND	1.6	0.12	800	
Methylene Chloride	ND	4.0	0.20	800	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 28

Parameter	Result	RL	MDL	DF	Qualifiers
4-Methyl-2-Pentanone	ND	1.2	0.30	800	
o-Xylene	0.20	0.40	0.13	800	J
p/m-Xylene	0.38	1.6	0.27	800	J
Styrene	0.16	1.2	0.051	800	J
Tetrachloroethene	ND	0.40	0.054	800	
Toluene	49	4.0	0.11	800	
Trichloroethene	ND	0.40	0.056	800	
Trichlorofluoromethane	ND	0.80	0.14	800	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	1.2	0.056	800	
1,1,1-Trichloroethane	ND	0.40	0.063	800	
1,1,2-Trichloroethane	ND	0.40	0.15	800	
1,3,5-Trimethylbenzene	ND	0.40	0.12	800	
1,1,2,2-Tetrachloroethane	ND	0.80	0.11	800	
1,2,4-Trimethylbenzene	ND	1.2	0.12	800	
1,2,4-Trichlorobenzene	ND	1.6	0.099	800	
Vinyl Acetate	ND	1.6	0.078	800	
Vinyl Chloride	ND	0.40	0.18	800	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	107	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	106	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01373	18-04-0819-3-A	04/09/18 10:05	Air	GC/MS OOO	N/A	04/12/18 17:55	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	3100	40	6.8	80000	
Ethylbenzene	870	40	12	80000	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	96	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01374	18-04-0819-4-A	04/09/18 10:05	Air	GC/MS OOO	N/A	04/11/18 20:41	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	8000	46	160000	
Benzene	8900	80	14	160000	
Benzyl Chloride	ND	240	7.8	160000	
Bromodichloromethane	ND	80	9.9	160000	
Bromoform	ND	80	13	160000	
Bromomethane	ND	80	22	160000	
2-Butanone	ND	240	69	160000	
Carbon Disulfide	ND	1600	44	160000	
Carbon Tetrachloride	ND	80	9.9	160000	
Chlorobenzene	ND	80	11	160000	
Chloroethane	ND	80	39	160000	
Chloroform	ND	80	11	160000	
Chloromethane	ND	80	38	160000	
Dibromochloromethane	ND	80	8.8	160000	
Dichlorodifluoromethane	ND	80	9.5	160000	
1,1-Dichloroethane	ND	80	10	160000	
1,1-Dichloroethene	ND	80	32	160000	
1,2-Dibromoethane	ND	80	11	160000	
Dichlorotetrafluoroethane	ND	320	42	160000	
1,2-Dichlorobenzene	ND	80	8.5	160000	
1,2-Dichloroethane	ND	80	11	160000	
1,2-Dichloropropane	ND	80	31	160000	
1,3-Dichlorobenzene	ND	80	26	160000	
1,4-Dichlorobenzene	ND	80	11	160000	
c-1,3-Dichloropropene	ND	80	10	160000	
c-1,2-Dichloroethene	ND	80	14	160000	
t-1,2-Dichloroethene	ND	80	20	160000	
t-1,3-Dichloropropene	ND	160	11	160000	
Ethylbenzene	3000	80	23	160000	
4-Ethyltoluene	ND	80	25	160000	
Hexachloro-1,3-Butadiene	ND	240	16	160000	
2-Hexanone	ND	240	70	160000	
Methyl-t-Butyl Ether (MTBE)	ND	320	24	160000	
Methylene Chloride	ND	800	40	160000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
 130 Robin Hill Road, Suite 100
 Santa Barbara, CA 93117-3153

Date Received: 04/10/18
 Work Order: 18-04-0819
 Preparation: N/A
 Method: EPA TO-15M
 Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
 60566446.2018.1.0601

Page 8 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	240	60	160000	
o-Xylene	ND	80	25	160000	
p/m-Xylene	ND	320	53	160000	
Styrene	ND	240	10	160000	
Tetrachloroethene	ND	80	11	160000	
Toluene	82	800	22	160000	J
Trichloroethene	ND	80	11	160000	
Trichlorofluoromethane	ND	160	27	160000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	240	11	160000	
1,1,1-Trichloroethane	ND	80	13	160000	
1,1,2-Trichloroethane	ND	80	29	160000	
1,3,5-Trimethylbenzene	ND	80	23	160000	
1,1,2,2-Tetrachloroethane	ND	160	22	160000	
1,2,4-Trimethylbenzene	ND	240	25	160000	
1,2,4-Trichlorobenzene	ND	320	20	160000	
Vinyl Acetate	ND	320	16	160000	
Vinyl Chloride	ND	80	36	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	97	57-129	
1,2-Dichloroethane-d4	111	47-137	
Toluene-d8	101	78-156	



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01375	18-04-0819-5-A	04/09/18 12:25	Air	GC/MS OOO	N/A	04/11/18 21:30	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	5000	29	100000	
Benzene	5700	50	8.5	100000	
Benzyl Chloride	ND	150	4.9	100000	
Bromodichloromethane	ND	50	6.2	100000	
Bromoform	ND	50	8.1	100000	
Bromomethane	ND	50	14	100000	
2-Butanone	ND	150	43	100000	
Carbon Disulfide	ND	1000	28	100000	
Carbon Tetrachloride	ND	50	6.2	100000	
Chlorobenzene	ND	50	6.8	100000	
Chloroethane	ND	50	24	100000	
Chloroform	ND	50	6.9	100000	
Chloromethane	ND	50	24	100000	
Dibromochloromethane	ND	50	5.5	100000	
Dichlorodifluoromethane	ND	50	6.0	100000	
1,1-Dichloroethane	ND	50	6.3	100000	
1,1-Dichloroethene	ND	50	20	100000	
1,2-Dibromoethane	ND	50	6.9	100000	
Dichlorotetrafluoroethane	ND	200	27	100000	
1,2-Dichlorobenzene	ND	50	5.3	100000	
1,2-Dichloroethane	ND	50	6.9	100000	
1,2-Dichloropropane	ND	50	19	100000	
1,3-Dichlorobenzene	ND	50	16	100000	
1,4-Dichlorobenzene	ND	50	6.7	100000	
c-1,3-Dichloropropene	ND	50	6.5	100000	
c-1,2-Dichloroethene	ND	50	8.7	100000	
t-1,2-Dichloroethene	ND	50	13	100000	
t-1,3-Dichloropropene	ND	100	6.9	100000	
Ethylbenzene	2700	50	14	100000	
4-Ethyltoluene	ND	50	16	100000	
Hexachloro-1,3-Butadiene	ND	150	10	100000	
2-Hexanone	ND	150	44	100000	
Methyl-t-Butyl Ether (MTBE)	ND	200	15	100000	
Methylene Chloride	ND	500	25	100000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 10 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	150	37	100000	
o-Xylene	ND	50	16	100000	
p/m-Xylene	ND	200	33	100000	
Styrene	ND	150	6.4	100000	
Tetrachloroethene	ND	50	6.7	100000	
Toluene	56	500	13	100000	J
Trichloroethene	ND	50	6.9	100000	
Trichlorofluoromethane	ND	100	17	100000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	150	7.0	100000	
1,1,1-Trichloroethane	ND	50	7.9	100000	
1,1,2-Trichloroethane	ND	50	18	100000	
1,3,5-Trimethylbenzene	ND	50	14	100000	
1,1,2,2-Tetrachloroethane	ND	100	14	100000	
1,2,4-Trimethylbenzene	ND	150	15	100000	
1,2,4-Trichlorobenzene	ND	200	12	100000	
Vinyl Acetate	ND	200	9.8	100000	
Vinyl Chloride	ND	50	22	100000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	100	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 11 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01376	18-04-0819-6-A	04/09/18 12:20	Air	GC/MS OOO	N/A	04/11/18 22:18	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	48	8000	46	160000	J
Benzene	7700	80	14	160000	
Benzyl Chloride	ND	240	7.8	160000	
Bromodichloromethane	ND	80	9.9	160000	
Bromoform	ND	80	13	160000	
Bromomethane	ND	80	22	160000	
2-Butanone	ND	240	69	160000	
Carbon Disulfide	ND	1600	44	160000	
Carbon Tetrachloride	ND	80	9.9	160000	
Chlorobenzene	ND	80	11	160000	
Chloroethane	ND	80	39	160000	
Chloroform	ND	80	11	160000	
Chloromethane	ND	80	38	160000	
Dibromochloromethane	ND	80	8.8	160000	
Dichlorodifluoromethane	ND	80	9.5	160000	
1,1-Dichloroethane	ND	80	10	160000	
1,1-Dichloroethene	ND	80	32	160000	
1,2-Dibromoethane	ND	80	11	160000	
Dichlorotetrafluoroethane	ND	320	42	160000	
1,2-Dichlorobenzene	ND	80	8.5	160000	
1,2-Dichloroethane	ND	80	11	160000	
1,2-Dichloropropane	ND	80	31	160000	
1,3-Dichlorobenzene	ND	80	26	160000	
1,4-Dichlorobenzene	ND	80	11	160000	
c-1,3-Dichloropropene	ND	80	10	160000	
c-1,2-Dichloroethene	ND	80	14	160000	
t-1,2-Dichloroethene	ND	80	20	160000	
t-1,3-Dichloropropene	ND	160	11	160000	
Ethylbenzene	2200	80	23	160000	
4-Ethyltoluene	ND	80	25	160000	
Hexachloro-1,3-Butadiene	ND	240	16	160000	
2-Hexanone	ND	240	70	160000	
Methyl-t-Butyl Ether (MTBE)	ND	320	24	160000	
Methylene Chloride	ND	800	40	160000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 12 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	240	60	160000	
o-Xylene	ND	80	25	160000	
p/m-Xylene	ND	320	53	160000	
Styrene	ND	240	10	160000	
Tetrachloroethene	ND	80	11	160000	
Toluene	65	800	22	160000	J
Trichloroethene	ND	80	11	160000	
Trichlorofluoromethane	ND	160	27	160000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	240	11	160000	
1,1,1-Trichloroethane	ND	80	13	160000	
1,1,2-Trichloroethane	ND	80	29	160000	
1,3,5-Trimethylbenzene	ND	80	23	160000	
1,1,2,2-Tetrachloroethane	ND	160	22	160000	
1,2,4-Trimethylbenzene	ND	240	25	160000	
1,2,4-Trichlorobenzene	ND	320	20	160000	
Vinyl Acetate	ND	320	16	160000	
Vinyl Chloride	ND	80	36	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	96	78-156	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 13 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01377	18-04-0819-7-A	04/09/18 13:15	Air	GC/MS OOO	N/A	04/11/18 23:03	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	30	4000	23	80000	J
Benzene	5100	40	6.8	80000	
Benzyl Chloride	ND	120	3.9	80000	
Bromodichloromethane	ND	40	5.0	80000	
Bromoform	ND	40	6.5	80000	
Bromomethane	ND	40	11	80000	
2-Butanone	ND	120	35	80000	
Carbon Disulfide	ND	800	22	80000	
Carbon Tetrachloride	ND	40	4.9	80000	
Chlorobenzene	ND	40	5.4	80000	
Chloroethane	ND	40	19	80000	
Chloroform	ND	40	5.5	80000	
Chloromethane	ND	40	19	80000	
Dibromochloromethane	ND	40	4.4	80000	
Dichlorodifluoromethane	ND	40	4.8	80000	
1,1-Dichloroethane	ND	40	5.0	80000	
1,1-Dichloroethene	ND	40	16	80000	
1,2-Dibromoethane	ND	40	5.5	80000	
Dichlorotetrafluoroethane	ND	160	21	80000	
1,2-Dichlorobenzene	ND	40	4.2	80000	
1,2-Dichloroethane	ND	40	5.5	80000	
1,2-Dichloropropane	ND	40	15	80000	
1,3-Dichlorobenzene	ND	40	13	80000	
1,4-Dichlorobenzene	ND	40	5.4	80000	
c-1,3-Dichloropropene	ND	40	5.2	80000	
c-1,2-Dichloroethene	ND	40	7.0	80000	
t-1,2-Dichloroethene	ND	40	10	80000	
t-1,3-Dichloropropene	ND	80	5.5	80000	
Ethylbenzene	2600	40	12	80000	
4-Ethyltoluene	ND	40	13	80000	
Hexachloro-1,3-Butadiene	ND	120	8.2	80000	
2-Hexanone	ND	120	35	80000	
Methyl-t-Butyl Ether (MTBE)	ND	160	12	80000	
Methylene Chloride	ND	400	20	80000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 14 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	120	30	80000	
o-Xylene	ND	40	13	80000	
p/m-Xylene	ND	160	27	80000	
Styrene	ND	120	5.1	80000	
Tetrachloroethene	ND	40	5.4	80000	
Toluene	55	400	11	80000	J
Trichloroethene	ND	40	5.6	80000	
Trichlorofluoromethane	ND	80	14	80000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	120	5.6	80000	
1,1,1-Trichloroethane	ND	40	6.3	80000	
1,1,2-Trichloroethane	ND	40	15	80000	
1,3,5-Trimethylbenzene	ND	40	12	80000	
1,1,2,2-Tetrachloroethane	ND	80	11	80000	
1,2,4-Trimethylbenzene	ND	120	12	80000	
1,2,4-Trichlorobenzene	ND	160	9.9	80000	
Vinyl Acetate	ND	160	7.8	80000	
Vinyl Chloride	ND	40	18	80000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	104	57-129	
1,2-Dichloroethane-d4	112	47-137	
Toluene-d8	98	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 15 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01378	18-04-0819-8-A	04/09/18 13:17	Air	GC/MS OOO	N/A	04/11/18 23:49	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	8000	46	160000	
Benzene	6900	80	14	160000	
Benzyl Chloride	ND	240	7.8	160000	
Bromodichloromethane	ND	80	9.9	160000	
Bromoform	ND	80	13	160000	
Bromomethane	ND	80	22	160000	
2-Butanone	ND	240	69	160000	
Carbon Disulfide	ND	1600	44	160000	
Carbon Tetrachloride	ND	80	9.9	160000	
Chlorobenzene	ND	80	11	160000	
Chloroethane	ND	80	39	160000	
Chloroform	ND	80	11	160000	
Chloromethane	ND	80	38	160000	
Dibromochloromethane	ND	80	8.8	160000	
Dichlorodifluoromethane	ND	80	9.5	160000	
1,1-Dichloroethane	ND	80	10	160000	
1,1-Dichloroethene	ND	80	32	160000	
1,2-Dibromoethane	ND	80	11	160000	
Dichlorotetrafluoroethane	ND	320	42	160000	
1,2-Dichlorobenzene	ND	80	8.5	160000	
1,2-Dichloroethane	ND	80	11	160000	
1,2-Dichloropropane	ND	80	31	160000	
1,3-Dichlorobenzene	ND	80	26	160000	
1,4-Dichlorobenzene	ND	80	11	160000	
c-1,3-Dichloropropene	ND	80	10	160000	
c-1,2-Dichloroethene	ND	80	14	160000	
t-1,2-Dichloroethene	ND	80	20	160000	
t-1,3-Dichloropropene	ND	160	11	160000	
Ethylbenzene	2700	80	23	160000	
4-Ethyltoluene	ND	80	25	160000	
Hexachloro-1,3-Butadiene	ND	240	16	160000	
2-Hexanone	ND	240	70	160000	
Methyl-t-Butyl Ether (MTBE)	ND	320	24	160000	
Methylene Chloride	ND	800	40	160000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 16 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	240	60	160000	
o-Xylene	ND	80	25	160000	
p/m-Xylene	ND	320	53	160000	
Styrene	ND	240	10	160000	
Tetrachloroethene	ND	80	11	160000	
Toluene	60	800	22	160000	J
Trichloroethene	ND	80	11	160000	
Trichlorofluoromethane	ND	160	27	160000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	240	11	160000	
1,1,1-Trichloroethane	ND	80	13	160000	
1,1,2-Trichloroethane	ND	80	29	160000	
1,3,5-Trimethylbenzene	ND	80	23	160000	
1,1,2,2-Tetrachloroethane	ND	160	22	160000	
1,2,4-Trimethylbenzene	ND	240	25	160000	
1,2,4-Trichlorobenzene	ND	320	20	160000	
Vinyl Acetate	ND	320	16	160000	
Vinyl Chloride	ND	80	36	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	99	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 17 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01379	18-04-0819-9-A	04/09/18 14:15	Air	GC/MS OOO	N/A	04/12/18 00:39	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	40	4000	23	80000	J
Benzene	4600	40	6.8	80000	
Benzyl Chloride	ND	120	3.9	80000	
Bromodichloromethane	ND	40	5.0	80000	
Bromoform	ND	40	6.5	80000	
Bromomethane	ND	40	11	80000	
2-Butanone	ND	120	35	80000	
Carbon Disulfide	ND	800	22	80000	
Carbon Tetrachloride	ND	40	4.9	80000	
Chlorobenzene	ND	40	5.4	80000	
Chloroethane	ND	40	19	80000	
Chloroform	ND	40	5.5	80000	
Chloromethane	ND	40	19	80000	
Dibromochloromethane	ND	40	4.4	80000	
Dichlorodifluoromethane	ND	40	4.8	80000	
1,1-Dichloroethane	ND	40	5.0	80000	
1,1-Dichloroethene	ND	40	16	80000	
1,2-Dibromoethane	ND	40	5.5	80000	
Dichlorotetrafluoroethane	ND	160	21	80000	
1,2-Dichlorobenzene	ND	40	4.2	80000	
1,2-Dichloroethane	ND	40	5.5	80000	
1,2-Dichloropropane	ND	40	15	80000	
1,3-Dichlorobenzene	ND	40	13	80000	
1,4-Dichlorobenzene	ND	40	5.4	80000	
c-1,3-Dichloropropene	ND	40	5.2	80000	
c-1,2-Dichloroethene	ND	40	7.0	80000	
t-1,2-Dichloroethene	ND	40	10	80000	
t-1,3-Dichloropropene	ND	80	5.5	80000	
Ethylbenzene	2100	40	12	80000	
4-Ethyltoluene	ND	40	13	80000	
Hexachloro-1,3-Butadiene	ND	120	8.2	80000	
2-Hexanone	ND	120	35	80000	
Methyl-t-Butyl Ether (MTBE)	ND	160	12	80000	
Methylene Chloride	ND	400	20	80000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 18 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	120	30	80000	
o-Xylene	ND	40	13	80000	
p/m-Xylene	ND	160	27	80000	
Styrene	ND	120	5.1	80000	
Tetrachloroethene	ND	40	5.4	80000	
Toluene	44	400	11	80000	J
Trichloroethene	ND	40	5.6	80000	
Trichlorofluoromethane	ND	80	14	80000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	120	5.6	80000	
1,1,1-Trichloroethane	ND	40	6.3	80000	
1,1,2-Trichloroethane	ND	40	15	80000	
1,3,5-Trimethylbenzene	ND	40	12	80000	
1,1,2,2-Tetrachloroethane	ND	80	11	80000	
1,2,4-Trimethylbenzene	ND	120	12	80000	
1,2,4-Trichlorobenzene	ND	160	9.9	80000	
Vinyl Acetate	ND	160	7.8	80000	
Vinyl Chloride	ND	40	18	80000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	99	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 19 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01380	18-04-0819-10-A	04/09/18 14:20	Air	GC/MS OOO	N/A	04/12/18 01:23	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	8000	46	160000	
Benzene	8300	80	14	160000	
Benzyl Chloride	ND	240	7.8	160000	
Bromodichloromethane	ND	80	9.9	160000	
Bromoform	ND	80	13	160000	
Bromomethane	ND	80	22	160000	
2-Butanone	ND	240	69	160000	
Carbon Disulfide	ND	1600	44	160000	
Carbon Tetrachloride	ND	80	9.9	160000	
Chlorobenzene	ND	80	11	160000	
Chloroethane	ND	80	39	160000	
Chloroform	ND	80	11	160000	
Chloromethane	ND	80	38	160000	
Dibromochloromethane	ND	80	8.8	160000	
Dichlorodifluoromethane	ND	80	9.5	160000	
1,1-Dichloroethane	ND	80	10	160000	
1,1-Dichloroethene	ND	80	32	160000	
1,2-Dibromoethane	ND	80	11	160000	
Dichlorotetrafluoroethane	ND	320	42	160000	
1,2-Dichlorobenzene	ND	80	8.5	160000	
1,2-Dichloroethane	ND	80	11	160000	
1,2-Dichloropropane	ND	80	31	160000	
1,3-Dichlorobenzene	ND	80	26	160000	
1,4-Dichlorobenzene	ND	80	11	160000	
c-1,3-Dichloropropene	ND	80	10	160000	
c-1,2-Dichloroethene	ND	80	14	160000	
t-1,2-Dichloroethene	ND	80	20	160000	
t-1,3-Dichloropropene	ND	160	11	160000	
Ethylbenzene	3000	80	23	160000	
4-Ethyltoluene	ND	80	25	160000	
Hexachloro-1,3-Butadiene	ND	240	16	160000	
2-Hexanone	ND	240	70	160000	
Methyl-t-Butyl Ether (MTBE)	ND	320	24	160000	
Methylene Chloride	ND	800	40	160000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 20 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	240	60	160000	
o-Xylene	ND	80	25	160000	
p/m-Xylene	ND	320	53	160000	
Styrene	ND	240	10	160000	
Tetrachloroethene	ND	80	11	160000	
Toluene	70	800	22	160000	J
Trichloroethene	ND	80	11	160000	
Trichlorofluoromethane	ND	160	27	160000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	240	11	160000	
1,1,1-Trichloroethane	ND	80	13	160000	
1,1,2-Trichloroethane	ND	80	29	160000	
1,3,5-Trimethylbenzene	ND	80	23	160000	
1,1,2,2-Tetrachloroethane	ND	160	22	160000	
1,2,4-Trimethylbenzene	ND	240	25	160000	
1,2,4-Trichlorobenzene	ND	320	20	160000	
Vinyl Acetate	ND	320	16	160000	
Vinyl Chloride	ND	80	36	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	103	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	98	78-156	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 21 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01381	18-04-0819-11-A	04/09/18 16:15	Air	GC/MS OOO	N/A	04/12/18 02:08	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	8000	46	160000	
Benzene	7900	80	14	160000	
Benzyl Chloride	ND	240	7.8	160000	
Bromodichloromethane	ND	80	9.9	160000	
Bromoform	ND	80	13	160000	
Bromomethane	ND	80	22	160000	
2-Butanone	ND	240	69	160000	
Carbon Disulfide	ND	1600	44	160000	
Carbon Tetrachloride	ND	80	9.9	160000	
Chlorobenzene	ND	80	11	160000	
Chloroethane	ND	80	39	160000	
Chloroform	ND	80	11	160000	
Chloromethane	ND	80	38	160000	
Dibromochloromethane	ND	80	8.8	160000	
Dichlorodifluoromethane	ND	80	9.5	160000	
1,1-Dichloroethane	ND	80	10	160000	
1,1-Dichloroethene	ND	80	32	160000	
1,2-Dibromoethane	ND	80	11	160000	
Dichlorotetrafluoroethane	ND	320	42	160000	
1,2-Dichlorobenzene	ND	80	8.5	160000	
1,2-Dichloroethane	ND	80	11	160000	
1,2-Dichloropropane	ND	80	31	160000	
1,3-Dichlorobenzene	ND	80	26	160000	
1,4-Dichlorobenzene	ND	80	11	160000	
c-1,3-Dichloropropene	ND	80	10	160000	
c-1,2-Dichloroethene	ND	80	14	160000	
t-1,2-Dichloroethene	ND	80	20	160000	
t-1,3-Dichloropropene	ND	160	11	160000	
Ethylbenzene	2700	80	23	160000	
4-Ethyltoluene	ND	80	25	160000	
Hexachloro-1,3-Butadiene	ND	240	16	160000	
2-Hexanone	ND	240	70	160000	
Methyl-t-Butyl Ether (MTBE)	ND	320	24	160000	
Methylene Chloride	ND	800	40	160000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 22 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	240	60	160000	
o-Xylene	ND	80	25	160000	
p/m-Xylene	ND	320	53	160000	
Styrene	ND	240	10	160000	
Tetrachloroethene	ND	80	11	160000	
Toluene	63	800	22	160000	J
Trichloroethene	ND	80	11	160000	
Trichlorofluoromethane	ND	160	27	160000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	240	11	160000	
1,1,1-Trichloroethane	ND	80	13	160000	
1,1,2-Trichloroethane	ND	80	29	160000	
1,3,5-Trimethylbenzene	ND	80	23	160000	
1,1,2,2-Tetrachloroethane	ND	160	22	160000	
1,2,4-Trimethylbenzene	ND	240	25	160000	
1,2,4-Trichlorobenzene	ND	320	20	160000	
Vinyl Acetate	ND	320	16	160000	
Vinyl Chloride	ND	80	36	160000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	107	47-137	
Toluene-d8	101	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 23 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01382	18-04-0819-12-A	04/09/18 16:20	Air	GC/MS OOO	N/A	04/12/18 02:54	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.35	20	0.11	400	J
Benzene	17	0.20	0.034	400	
Benzyl Chloride	ND	0.60	0.020	400	
Bromodichloromethane	ND	0.20	0.025	400	
Bromoform	ND	0.20	0.032	400	
Bromomethane	ND	0.20	0.055	400	
2-Butanone	ND	0.60	0.17	400	
Carbon Disulfide	ND	4.0	0.11	400	
Carbon Tetrachloride	ND	0.20	0.025	400	
Chlorobenzene	ND	0.20	0.027	400	
Chloroethane	ND	0.20	0.096	400	
Chloroform	ND	0.20	0.028	400	
Chloromethane	ND	0.20	0.096	400	
Dibromochloromethane	ND	0.20	0.022	400	
Dichlorodifluoromethane	ND	0.20	0.024	400	
1,1-Dichloroethane	ND	0.20	0.025	400	
1,1-Dichloroethene	ND	0.20	0.080	400	
1,2-Dibromoethane	ND	0.20	0.028	400	
Dichlorotetrafluoroethane	ND	0.80	0.11	400	
1,2-Dichlorobenzene	ND	0.20	0.021	400	
1,2-Dichloroethane	ND	0.20	0.027	400	
1,2-Dichloropropane	ND	0.20	0.076	400	
1,3-Dichlorobenzene	ND	0.20	0.065	400	
1,4-Dichlorobenzene	ND	0.20	0.027	400	
c-1,3-Dichloropropene	ND	0.20	0.026	400	
c-1,2-Dichloroethene	ND	0.20	0.035	400	
t-1,2-Dichloroethene	ND	0.20	0.051	400	
t-1,3-Dichloropropene	ND	0.40	0.028	400	
Ethylbenzene	51	0.20	0.058	400	E
4-Ethyltoluene	ND	0.20	0.064	400	
Hexachloro-1,3-Butadiene	ND	0.60	0.041	400	
2-Hexanone	ND	0.60	0.18	400	
Methyl-t-Butyl Ether (MTBE)	ND	0.80	0.061	400	
Methylene Chloride	ND	2.0	0.099	400	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 24 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.60	0.15	400	
o-Xylene	ND	0.20	0.063	400	
p/m-Xylene	ND	0.80	0.13	400	
Styrene	ND	0.60	0.025	400	
Tetrachloroethene	ND	0.20	0.027	400	
Toluene	0.53	2.0	0.054	400	J
Trichloroethene	ND	0.20	0.028	400	
Trichlorofluoromethane	ND	0.40	0.068	400	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.60	0.028	400	
1,1,1-Trichloroethane	ND	0.20	0.032	400	
1,1,2-Trichloroethane	ND	0.20	0.073	400	
1,3,5-Trimethylbenzene	ND	0.20	0.058	400	
1,1,2,2-Tetrachloroethane	ND	0.40	0.055	400	
1,2,4-Trimethylbenzene	ND	0.60	0.061	400	
1,2,4-Trichlorobenzene	ND	0.80	0.050	400	
Vinyl Acetate	ND	0.80	0.039	400	
Vinyl Chloride	ND	0.20	0.089	400	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	106	57-129	
1,2-Dichloroethane-d4	107	47-137	
Toluene-d8	97	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01382	18-04-0819-12-A	04/09/18 16:20	Air	GC/MS OOO	N/A	04/12/18 18:44	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethylbenzene	39	0.50	0.14	1000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	97	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 25 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01383	18-04-0819-13-A	04/09/18 16:25	Air	GC/MS OOO	N/A	04/12/18 03:38	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.53	31	0.18	625	J
Benzene	33	0.31	0.053	625	
Benzyl Chloride	ND	0.94	0.031	625	
Bromodichloromethane	ND	0.31	0.039	625	
Bromoform	ND	0.31	0.051	625	
Bromomethane	ND	0.31	0.087	625	
2-Butanone	ND	0.94	0.27	625	
Carbon Disulfide	ND	6.2	0.17	625	
Carbon Tetrachloride	ND	0.31	0.039	625	
Chlorobenzene	ND	0.31	0.042	625	
Chloroethane	ND	0.31	0.15	625	
Chloroform	ND	0.31	0.043	625	
Chloromethane	ND	0.31	0.15	625	
Dibromochloromethane	ND	0.31	0.034	625	
Dichlorodifluoromethane	ND	0.31	0.037	625	
1,1-Dichloroethane	ND	0.31	0.039	625	
1,1-Dichloroethene	ND	0.31	0.12	625	
1,2-Dibromoethane	ND	0.31	0.043	625	
Dichlorotetrafluoroethane	ND	1.2	0.17	625	
1,2-Dichlorobenzene	ND	0.31	0.033	625	
1,2-Dichloroethane	ND	0.31	0.043	625	
1,2-Dichloropropane	ND	0.31	0.12	625	
1,3-Dichlorobenzene	ND	0.31	0.10	625	
1,4-Dichlorobenzene	ND	0.31	0.042	625	
c-1,3-Dichloropropene	ND	0.31	0.041	625	
c-1,2-Dichloroethene	ND	0.31	0.055	625	
t-1,2-Dichloroethene	ND	0.31	0.080	625	
t-1,3-Dichloropropene	ND	0.62	0.043	625	
Ethylbenzene	110	0.31	0.091	625	E
4-Ethyltoluene	ND	0.31	0.099	625	
Hexachloro-1,3-Butadiene	ND	0.94	0.064	625	
2-Hexanone	ND	0.94	0.27	625	
Methyl-t-Butyl Ether (MTBE)	ND	1.2	0.095	625	
Methylene Chloride	ND	3.1	0.15	625	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 26 of 28

Parameter	Result	RL	MDL	DF	Qualifiers
4-Methyl-2-Pentanone	ND	0.94	0.23	625	
o-Xylene	ND	0.31	0.098	625	
p/m-Xylene	ND	1.2	0.21	625	
Styrene	ND	0.94	0.040	625	
Tetrachloroethene	ND	0.31	0.042	625	
Toluene	1.0	3.1	0.084	625	J
Trichloroethene	ND	0.31	0.043	625	
Trichlorofluoromethane	ND	0.62	0.11	625	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.94	0.044	625	
1,1,1-Trichloroethane	ND	0.31	0.049	625	
1,1,2-Trichloroethane	ND	0.31	0.11	625	
1,3,5-Trimethylbenzene	ND	0.31	0.091	625	
1,1,2,2-Tetrachloroethane	ND	0.62	0.086	625	
1,2,4-Trimethylbenzene	ND	0.94	0.096	625	
1,2,4-Trichlorobenzene	ND	1.2	0.078	625	
Vinyl Acetate	ND	1.2	0.061	625	
Vinyl Chloride	ND	0.31	0.14	625	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	110	57-129	
1,2-Dichloroethane-d4	105	47-137	
Toluene-d8	98	78-156	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01383	18-04-0819-13-A	04/09/18 16:25	Air	GC/MS OOO	N/A	04/12/18 19:33	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Ethylbenzene	82	1.2	0.36	2500	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	93	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 27 of 28

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8448	N/A	Air	GC/MS OOO	N/A	04/11/18 15:32	180411L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 28 of 28

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	98	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
Method Blank	099-12-981-8449	N/A	Air	GC/MS OOO	N/A	04/12/18 16:40	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Benzene	ND	0.00050	0.000085	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	100	47-137	
Toluene-d8	98	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01371	18-04-0819-1-A	04/09/18 08:35	Air	GC 13	N/A	04/11/18 11:22	180411L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	5700	30	8.6	20.0	

VSS01372	18-04-0819-2-A	04/09/18 08:33	Air	GC 13	N/A	04/11/18 12:13	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	17000	75	21	50.0	

VSS01373	18-04-0819-3-A	04/09/18 10:05	Air	GC 13	N/A	04/11/18 12:28	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	9400	75	21	50.0	

VSS01374	18-04-0819-4-A	04/09/18 10:05	Air	GC 13	N/A	04/11/18 12:41	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	19000	75	21	50.0	

VSS01375	18-04-0819-5-A	04/09/18 12:25	Air	GC 13	N/A	04/11/18 12:54	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	12000	75	21	50.0	

VSS01376	18-04-0819-6-A	04/09/18 12:20	Air	GC 13	N/A	04/11/18 13:25	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	18000	75	21	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01377	18-04-0819-7-A	04/09/18 13:15	Air	GC 13	N/A	04/11/18 13:44	180411L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	11000	75	21	50.0	

VSS01378	18-04-0819-8-A	04/09/18 13:17	Air	GC 13	N/A	04/11/18 14:01	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	19000	75	21	50.0	

VSS01379	18-04-0819-9-A	04/09/18 14:15	Air	GC 13	N/A	04/11/18 14:18	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	11000	75	21	50.0	

VSS01380	18-04-0819-10-A	04/09/18 14:20	Air	GC 13	N/A	04/11/18 14:38	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	18000	75	21	50.0	

VSS01381	18-04-0819-11-A	04/09/18 16:15	Air	GC 13	N/A	04/11/18 14:54	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	17000	75	21	50.0	

VSS01382	18-04-0819-12-A	04/09/18 16:20	Air	GC 13	N/A	04/11/18 15:18	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	110	1.5	0.43	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01383	18-04-0819-13-A	04/09/18 16:25	Air	GC 13	N/A	04/11/18 15:42	180411L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	170	1.5	0.43	1.00	

Method Blank	098-01-005-8407	N/A	Air	GC 13	N/A	04/11/18 10:52	180411L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	ND	1.5	0.43	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01371	18-04-0819-1-A	04/09/18 08:35	Air	GC 14	N/A	04/17/18 17:36	180417L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	120	1.0	0.21	1.00	

VSS01372	18-04-0819-2-A	04/09/18 08:33	Air	GC 14	N/A	04/17/18 17:59	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	290	1.0	0.21	1.00	

VSS01373	18-04-0819-3-A	04/09/18 10:05	Air	GC 14	N/A	04/17/18 18:20	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	130	1.0	0.21	1.00	

VSS01374	18-04-0819-4-A	04/09/18 10:05	Air	GC 14	N/A	04/17/18 18:41	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	290	1.0	0.21	1.00	

VSS01375	18-04-0819-5-A	04/09/18 12:25	Air	GC 14	N/A	04/17/18 19:02	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	200	1.0	0.21	1.00	

VSS01376	18-04-0819-6-A	04/09/18 12:20	Air	GC 14	N/A	04/17/18 19:19	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	280	1.0	0.21	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01377	18-04-0819-7-A	04/09/18 13:15	Air	GC 14	N/A	04/17/18 19:37	180417L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	170	1.0	0.21	1.00	

VSS01378	18-04-0819-8-A	04/09/18 13:17	Air	GC 14	N/A	04/17/18 20:01	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	350	1.0	0.21	1.00	

VSS01379	18-04-0819-9-A	04/09/18 14:15	Air	GC 14	N/A	04/17/18 20:17	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	130	1.0	0.21	1.00	

VSS01380	18-04-0819-10-A	04/09/18 14:20	Air	GC 14	N/A	04/17/18 20:33	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	330	1.0	0.21	1.00	

VSS01381	18-04-0819-11-A	04/09/18 16:15	Air	GC 14	N/A	04/17/18 20:50	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	250	1.0	0.21	1.00	

VSS01382	18-04-0819-12-A	04/09/18 16:20	Air	GC 14	N/A	04/17/18 21:05	180417L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	0.82	1.0	0.21	1.00	J

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-07-024-1541	N/A	Air	GC 14	N/A	04/17/18 13:34	180417L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	ND	1.0	0.21	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/10/18 Work Order: 18-04-0819 Preparation: N/A Method: EPA TO-3M Page 1 of 1
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
VSS01371	Sample	Air	GC 13	N/A	04/11/18 11:22	180411D01
VSS01371	Sample Duplicate	Air	GC 13	N/A	04/11/18 11:35	180411D01
<u>Parameter</u>	<u>Sample Conc.</u>		<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	5669		5703	1	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-764	LCS	Air	GC 65	N/A	04/11/18 10:04	180411L02			
099-16-444-764	LCSD	Air	GC 65	N/A	04/11/18 10:22	180411L02			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	14.85	99	15.31	102	80-120	3	0-30	
Carbon Monoxide	7.020	6.702	95	6.773	96	80-120	1	0-30	
Oxygen (+ Argon)	3.990	3.896	98	3.852	97	80-120	1	0-30	
Nitrogen	69.45	64.33	93	64.65	93	80-120	1	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8448	LCS	Air	GC/MS OOO	N/A	04/11/18 13:01	180411L02
099-12-981-8448	LCSD	Air	GC/MS OOO	N/A	04/11/18 13:51	180411L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02860	114	0.02876	115	50-150	33-167	1	0-35	
Benzene	0.02500	0.02751	110	0.02675	107	60-156	44-172	3	0-40	
Benzyl Chloride	0.02500	0.03109	124	0.02892	116	50-150	33-167	7	0-35	
Bromodichloromethane	0.02500	0.02834	113	0.02724	109	50-150	33-167	4	0-35	
Bromoform	0.02500	0.02544	102	0.02776	111	50-150	33-167	9	0-38	
Bromomethane	0.02500	0.02543	102	0.02585	103	50-150	33-167	2	0-35	
2-Butanone	0.02500	0.03093	124	0.02913	117	50-150	33-167	6	0-35	
Carbon Disulfide	0.02500	0.02792	112	0.02715	109	50-150	33-167	3	0-35	
Carbon Tetrachloride	0.02500	0.02784	111	0.02759	110	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02675	107	0.02765	111	50-150	33-167	3	0-35	
Chloroethane	0.02500	0.02753	110	0.02786	111	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02769	111	0.02697	108	50-150	33-167	3	0-35	
Chloromethane	0.02500	0.03118	125	0.03112	124	50-150	33-167	0	0-35	
Dibromochloromethane	0.02500	0.02643	106	0.02855	114	50-150	33-167	8	0-35	
Dichlorodifluoromethane	0.02500	0.03249	130	0.03257	130	50-150	33-167	0	0-35	
1,1-Dichloroethane	0.02500	0.02833	113	0.02796	112	50-150	33-167	1	0-35	
1,1-Dichloroethene	0.02500	0.02876	115	0.02752	110	50-150	33-167	4	0-35	
1,2-Dibromoethane	0.02500	0.02753	110	0.02967	119	54-144	39-159	7	0-36	
Dichlorotetrafluoroethane	0.02500	0.02836	113	0.02849	114	50-150	33-167	0	0-35	
1,2-Dichlorobenzene	0.02500	0.02673	107	0.02710	108	34-160	13-181	1	0-47	
1,2-Dichloroethane	0.02500	0.02904	116	0.02827	113	69-153	55-167	3	0-35	
1,2-Dichloropropane	0.02500	0.02813	113	0.02810	112	67-157	52-172	0	0-35	
1,3-Dichlorobenzene	0.02500	0.02910	116	0.02770	111	50-150	33-167	5	0-35	
1,4-Dichlorobenzene	0.02500	0.02749	110	0.02695	108	36-156	16-176	2	0-47	
c-1,3-Dichloropropene	0.02500	0.03026	121	0.03046	122	61-157	45-173	1	0-35	
c-1,2-Dichloroethene	0.02500	0.02772	111	0.02738	110	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02694	108	0.02730	109	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02983	119	0.03134	125	50-150	33-167	5	0-35	
Ethylbenzene	0.02500	0.02762	110	0.02886	115	52-154	35-171	4	0-38	
4-Ethyltoluene	0.02500	0.02767	111	0.02940	118	50-150	33-167	6	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02848	114	0.02810	112	50-150	33-167	1	0-35	
2-Hexanone	0.02500	0.02950	118	0.03178	127	50-150	33-167	7	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02773	111	0.02741	110	50-150	33-167	1	0-35	
Methylene Chloride	0.02500	0.02807	112	0.02780	111	50-150	33-167	1	0-35	
4-Methyl-2-Pentanone	0.02500	0.03016	121	0.02890	116	50-150	33-167	4	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 9

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02779	111	0.02794	112	52-148	36-164	1	0-38	
p/m-Xylene	0.05000	0.05462	109	0.06024	120	42-156	23-175	10	0-41	
Styrene	0.02500	0.02782	111	0.02751	110	50-150	33-167	1	0-35	
Tetrachloroethene	0.02500	0.02710	108	0.02768	111	56-152	40-168	2	0-40	
Toluene	0.02500	0.02788	112	0.02725	109	56-146	41-161	2	0-43	
Trichloroethene	0.02500	0.02899	116	0.02789	112	63-159	47-175	4	0-34	
Trichlorofluoromethane	0.02500	0.02723	109	0.02707	108	50-150	33-167	1	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02780	111	0.02721	109	50-150	33-167	2	0-35	
1,1,1-Trichloroethane	0.02500	0.02770	111	0.02728	109	50-150	33-167	2	0-35	
1,1,2-Trichloroethane	0.02500	0.02941	118	0.02931	117	65-149	51-163	0	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02754	110	0.02942	118	50-150	33-167	7	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02885	115	0.02958	118	50-150	33-167	3	0-35	
1,2,4-Trimethylbenzene	0.02500	0.03072	123	0.02989	120	50-150	33-167	3	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02986	119	0.02991	120	50-150	33-167	0	0-35	
Vinyl Acetate	0.02500	0.03122	125	0.02941	118	50-150	33-167	6	0-35	
Vinyl Chloride	0.02500	0.02842	114	0.02880	115	45-177	23-199	1	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8448	LCS	Air	GC/MS OOO	N/A	04/11/18 13:01	180411L02	
099-12-981-8448	LCSD	Air	GC/MS OOO	N/A	04/11/18 13:51	180411L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02580	103	0.02626	105	57-129	
1,2-Dichloroethane-d4	0.02500	0.02635	105	0.02561	102	47-137	
Toluene-d8	0.02500	0.02605	104	0.02627	105	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-981-8449	LCS	Air	GC/MS OOO	N/A	04/12/18 14:09	180412L02
099-12-981-8449	LCSD	Air	GC/MS OOO	N/A	04/12/18 15:00	180412L02

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02774	111	0.02748	110	50-150	33-167	1	0-35	
Benzene	0.02500	0.02547	102	0.02591	104	60-156	44-172	2	0-40	
Benzyl Chloride	0.02500	0.02660	106	0.02785	111	50-150	33-167	5	0-35	
Bromodichloromethane	0.02500	0.02596	104	0.02639	106	50-150	33-167	2	0-35	
Bromoform	0.02500	0.02537	101	0.02840	114	50-150	33-167	11	0-38	
Bromomethane	0.02500	0.02416	97	0.02427	97	50-150	33-167	0	0-35	
2-Butanone	0.02500	0.02643	106	0.02742	110	50-150	33-167	4	0-35	
Carbon Disulfide	0.02500	0.02698	108	0.02649	106	50-150	33-167	2	0-35	
Carbon Tetrachloride	0.02500	0.02592	104	0.02619	105	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02622	105	0.02695	108	50-150	33-167	3	0-35	
Chloroethane	0.02500	0.02605	104	0.02627	105	50-150	33-167	1	0-35	
Chloroform	0.02500	0.02536	101	0.02585	103	50-150	33-167	2	0-35	
Chloromethane	0.02500	0.02870	115	0.02807	112	50-150	33-167	2	0-35	
Dibromochloromethane	0.02500	0.02561	102	0.02729	109	50-150	33-167	6	0-35	
Dichlorodifluoromethane	0.02500	0.03120	125	0.03042	122	50-150	33-167	3	0-35	
1,1-Dichloroethane	0.02500	0.02533	101	0.02677	107	50-150	33-167	6	0-35	
1,1-Dichloroethene	0.02500	0.02642	106	0.02612	104	50-150	33-167	1	0-35	
1,2-Dibromoethane	0.02500	0.02683	107	0.02840	114	54-144	39-159	6	0-36	
Dichlorotetrafluoroethane	0.02500	0.02664	107	0.02634	105	50-150	33-167	1	0-35	
1,2-Dichlorobenzene	0.02500	0.02691	108	0.02741	110	34-160	13-181	2	0-47	
1,2-Dichloroethane	0.02500	0.02636	105	0.02664	107	69-153	55-167	1	0-35	
1,2-Dichloropropane	0.02500	0.02646	106	0.02679	107	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02555	102	0.02607	104	50-150	33-167	2	0-35	
1,4-Dichlorobenzene	0.02500	0.02475	99	0.02567	103	36-156	16-176	4	0-47	
c-1,3-Dichloropropene	0.02500	0.02782	111	0.02906	116	61-157	45-173	4	0-35	
c-1,2-Dichloroethene	0.02500	0.02519	101	0.02673	107	50-150	33-167	6	0-35	
t-1,2-Dichloroethene	0.02500	0.02443	98	0.02647	106	50-150	33-167	8	0-35	
t-1,3-Dichloropropene	0.02500	0.02861	114	0.02897	116	50-150	33-167	1	0-35	
Ethylbenzene	0.02500	0.02678	107	0.02805	112	52-154	35-171	5	0-38	
4-Ethyltoluene	0.02500	0.02605	104	0.02634	105	50-150	33-167	1	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02717	109	0.02822	113	50-150	33-167	4	0-35	
2-Hexanone	0.02500	0.02848	114	0.02960	118	50-150	33-167	4	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02527	101	0.02643	106	50-150	33-167	5	0-35	
Methylene Chloride	0.02500	0.02497	100	0.02702	108	50-150	33-167	8	0-35	
4-Methyl-2-Pentanone	0.02500	0.02752	110	0.02769	111	50-150	33-167	1	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 9

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02507	100	0.02604	104	52-148	36-164	4	0-38	
p/m-Xylene	0.05000	0.05193	104	0.05909	118	42-156	23-175	13	0-41	
Styrene	0.02500	0.02593	104	0.02681	107	50-150	33-167	3	0-35	
Tetrachloroethene	0.02500	0.02529	101	0.02638	106	56-152	40-168	4	0-40	
Toluene	0.02500	0.02526	101	0.02691	108	56-146	41-161	6	0-43	
Trichloroethene	0.02500	0.02627	105	0.02690	108	63-159	47-175	2	0-34	
Trichlorofluoromethane	0.02500	0.02643	106	0.02620	105	50-150	33-167	1	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02678	107	0.02643	106	50-150	33-167	1	0-35	
1,1,1-Trichloroethane	0.02500	0.02579	103	0.02635	105	50-150	33-167	2	0-35	
1,1,2-Trichloroethane	0.02500	0.02695	108	0.02716	109	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02565	103	0.02621	105	50-150	33-167	2	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02619	105	0.02704	108	50-150	33-167	3	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02573	103	0.02649	106	50-150	33-167	3	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02847	114	0.02986	119	50-150	33-167	5	0-35	
Vinyl Acetate	0.02500	0.02675	107	0.02743	110	50-150	33-167	3	0-35	
Vinyl Chloride	0.02500	0.02680	107	0.02663	107	45-177	23-199	1	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8449	LCS	Air	GC/MS OOO	N/A	04/12/18 14:09	180412L02	
099-12-981-8449	LCSD	Air	GC/MS OOO	N/A	04/12/18 15:00	180412L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02494	100	0.02566	103	57-129	
1,2-Dichloroethane-d4	0.02500	0.02518	101	0.02480	99	47-137	
Toluene-d8	0.02500	0.02513	101	0.02499	100	78-156	


 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: EPA TO-3M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8407	LCS	Air	GC 13	N/A	04/11/18 10:26	180411L01
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	193.3	97	80-120	

Return to Contents



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/10/18
Work Order: 18-04-0819
Preparation: N/A
Method: SCAQMD 25.1M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1541	LCS	Air	GC 14	N/A	04/17/18 12:46	180417L02			
099-07-024-1541	LCSD	Air	GC 14	N/A	04/17/18 13:06	180417L02			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	101.0	91.50	91	91.90	91	80-120	0	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Sample Analysis Summary Report

Work Order: 18-04-0819

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	748	GC 65	2
ASTM D-1946	N/A	1145	GC 65	2
EPA TO-15M	N/A	953	GC/MS 000	2
EPA TO-3M	N/A	748	GC 13	2
EPA TO-3M	N/A	1145	GC 13	2
SCAQMD 25.1M	N/A	1145	GC 14	2


Return to Contents

Glossary of Terms and Qualifiers

Work Order: 18-04-0819

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



Shell Oil Products US Chain Of Custody Record

AECOM

LAB (LOCATION)

☐ ACCUTEST ()
☒ CALSCIENCE ()
☐ TESTAMERICA ()
☐ Other ()

Lab Vendor # 1080777 (CalScience)

Please Check Appropriate Box:

☒ ISGW FDG ☐ MOTIVA RETAIL ☐ SHELL RETAIL
☐ MOTIVA SD&CH ☐ CONSULTANT ☐ LUBES
☐ SHELL PIPELINE ☐ OTHER _____

LOG CODE:

AECOM

130 Robin Hill Road, Suite 100, Santa Barbara CA, 93117

PROJECT CONTACT (Handcopy or PDF Report to):

Julie Doane-Allmon

TELEPHONE: 805-692-0618

FAX: 805-964-0259

Bill To Contact E-MAIL: julie.doane-allmon@aecom.com

TURNAROUND TIME (CALENDAR DAYS):

☒ STANDARD (14 DAY)☐ 5 DAYS☐ 3 DAYS☐ 2 DAYS☐ 24 HOURS☐ RESULTS NEEDED ON WEEKEND☐ LA - RWQCB REPORT FORMAT☐ LIST AGENCY:☐ LEVEL 1☐ LEVEL 2☐ LEVEL 3☒ LEVEL 4☐ OTHER (SPECIFY) _____

DELIVERABLES:

Cooler #1

Cooler #2

Cooler #3

SPECIAL INSTRUCTIONS OR NOTES:

Email results to: julie.doane-allmon@aecom.com;
 daniel.grasnick@aecom.com; steve.j.cole@aecom.com;
 jude.francis@aecom.com; and margaret.pittman@aecom.com

☒ SHELL CONTRACT RATE APPLIES
☐ STATE REIMBURSEMENT RATE APPLIES
☐ EDO NOT NEEDED
☒ RECEIPT VERIFICATION REQUESTED
☐ PROVIDE LEDD DISK

Print Bill To Contact Name:

Julie Doane-Allmon

PO #

964833

State

CA

AECOM Project / Task Number:

60566446.2018.1.0601

E-MAIL:

steve.j.cole@aecom.com

Direct: 213-996-2398

300 S. Grand Ave., Ste. 800, LA, CA 90071

SAMPLER NAME(S) (Print):

Maggie Pittman

LAB USE ONLY

18-04-0819

REQUESTED ANALYSIS

UNIT COST

NON-UNIT COST

EPA TO-15M

(S) LAB-127 VOCs full list + MTBE

EPA TO-3M (TPH as gasoline)

ASTM Method D-1946 Fixed

Gases

SCAQMD 25.1 Methane (ppmv)

FIELD NOTES:

TEMPERATURE ON RECEIPT

C°

Container PID Readings or Laboratory Notes

Field Sample Identification

LAB USE ONLY	DATE	TIME	SAMPLING	MATRIX	PRESERVATIVE				NO. OF CONT.
					HCL	HNO3	H2SO4	OTHER	
1	4/18/18	0835	air	air				X	1
2	4/18/18	0833	air	air				X	1
3	4/18/18	1005	air	air				X	1
4	4/18/18	1005	air	air				X	1
5	4/18/18	1225	air	air				X	1
6	4/18/18	1220	air	air				X	1
7	4/18/18	1315	air	air				X	1
8	4/18/18	1317	air	air				X	1
9	4/18/18	1415	air	air				X	1
10	4/18/18	1420	air	air				X	1

Requisitioned by (Signature)

mpe

Received by (Signature)

Jff O-ell

Requisitioned by (Signature)

Jff O-ell

Received by (Signature)

Jff O-ell

Requisitioned by (Signature)

Jff O-ell

Received by (Signature)

Jff O-ell

Date: 4/10/18

Time: 1518

Date: 4/10/18

Time: 1810

Date: 4/10/18

Time: 1810

Shell Oil Products US Chain Of Custody Record

A=COM

[illegible]

SAMPLE RECEIPT CHECKLIST

COOLER ① OF ①

CLIENT: Aecom

DATE: 04/10/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): _____ °C (w/ CF): _____ °C; ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☒ Air ☐ Filter

Checked by: 1091

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☐ Not Present ☒ N/A

Checked by: 1091

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A

Checked by: 619

SAMPLE CONDITION:

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH__9)
☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH__2) ☐ 250PB ☐ 250PB_n (pH__2) ☐ 500AGB ☐ 500AG_J ☐ 500AG_J_s (pH__2) ☐ 500PB
☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s (pH__2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH__12) ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____

Air: ☒ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 619

s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, znna = Zn (CH₃CO₂)₂ + NaOH

Reviewed by: 1052

**WORK ORDER NUMBER: 18-04-1056***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** AECOM**Client Project Name:** Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601**Attention:** Julie Doane-Allmon
130 Robin Hill Road
Suite 100
Santa Barbara, CA 93117-3153*Vikas Patel*

Approved for release on 05/03/2018 by:
Vikas Patel
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
 Work Order Number: 18-04-1056

1	Work Order Narrative.	3
2	Sample Summary.	4
3	QC Association Summary.	5
4	Detections Summary.	6
5	Client Sample Data.	8
	5.1 ASTM D-1946 Fixed Gases (Air).	8
	5.2 EPA TO-15 (M) Full List (Air).	10
	5.3 EPA TO-3 (M) TPH Gasoline (Air).	24
	5.4 SCAQMD 25.1 TGNMO and CH4 (Air).	26
6	Quality Control Sample Data.	27
	6.1 Sample Duplicate.	27
	6.2 LCS/LCSD.	29
7	Sample Analysis Summary.	36
8	Glossary of Terms and Qualifiers.	37
9	Chain-of-Custody/Sample Receipt Form.	38

Work Order Narrative

Work Order: 18-04-1056

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/12/18. They were assigned to Work Order 18-04-1056.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



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Sample Summary

Client: AECOM	Work Order: 18-04-1056
130 Robin Hill Road, Suite 100	Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Santa Barbara, CA 93117-3153	PO Number: 100067
	Date/Time Received: 04/12/18 18:15
	Number of Containers: 6

Attn: Julie Doane-Allmon

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VSS01384	18-04-1056-1	04/11/18 10:28	1	Air
VSS01385	18-04-1056-2	04/11/18 10:25	1	Air
VSS01386	18-04-1056-3	04/11/18 10:30	1	Air
VSS01387	18-04-1056-4	04/12/18 10:00	1	Air
VSS01388	18-04-1056-5	04/12/18 10:00	1	Air
VSS01389	18-04-1056-6	04/12/18 10:05	1	Air


Return to Contents

QC Association Summary

Work Order: 18-04-1056

Page 1 of 1

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01384	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01384	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01384	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180412D02	180412L02
VSS01384	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L04
VSS01385	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01385	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01385	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180412D02	180412L02
VSS01385	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L04
VSS01386	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01386	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180412D02	180412L02
VSS01387	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01387	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01387	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180413D01	180413L01
VSS01387	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L04
VSS01388	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01388	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01388	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180413D01	180413L01
VSS01388	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L04
VSS01389	EPA TO-15 (M) Full List		N/A	GC/MS ZZ	*2	180413L02
VSS01389	EPA TO-15 (M) Full List	R	N/A	GC/MS ZZ	*1	180413L02
VSS01389	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180412D02	180412L02



Return to Contents

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-1056
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/12/18

Attn: Julie Doane-Allmon

Page 1 of 2

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01384 (18-04-1056-1)						
Carbon Dioxide	14.9		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	6.29		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.8		0.500	%v	ASTM D-1946	N/A
Benzene	7500		50	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	4800		50	ppm (v/v)	EPA TO-15M	N/A
Toluene	85	J	13*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	16000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	270		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01385 (18-04-1056-2)						
Carbon Dioxide	7.48		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	14.0		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.6		0.500	%v	ASTM D-1946	N/A
Acetone	14	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	3900		25	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3200		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	50	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
Trichloroethene	9.3	J	3.5*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	8900		75	ppm (v/v)	EPA TO-3M	N/A
Methane	130		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01386 (18-04-1056-3)						
Benzene	81		2.0	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	310		2.0	ppm (v/v)	EPA TO-15M	N/A
Toluene	2.4	J	0.54*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	570		3.8	ppm (v/v)	EPA TO-3M	N/A
VSS01387 (18-04-1056-4)						
Carbon Dioxide	14.4		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	7.55		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.0		0.500	%v	ASTM D-1946	N/A
Benzene	7200		50	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	5900		50	ppm (v/v)	EPA TO-15M	N/A
Toluene	87	J	13*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	15000		75	ppm (v/v)	EPA TO-3M	N/A
Methane	140		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

* MDL is shown



Calscience

Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-1056
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/12/18

Attn: Julie Doane-Allmon

Page 2 of 2

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01388 (18-04-1056-5)						
Carbon Dioxide	7.62		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	14.2		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.2		0.500	%v	ASTM D-1946	N/A
Acetone	18	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	4100		25	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	3400		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	54	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
Trichloroethene	4.0	J	3.5*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	8500		75	ppm (v/v)	EPA TO-3M	N/A
Methane	76		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01389 (18-04-1056-6)						
Benzene	64		0.80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	180	E	0.80	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	130		2.0	ppm (v/v)	EPA TO-15M	N/A
Toluene	1.7	J	0.22*	ppm (v/v)	EPA TO-15M	N/A
Trichloroethene	0.11	J	0.11*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	540		3.8	ppm (v/v)	EPA TO-3M	N/A

Subcontracted analyses, if any, are not included in this summary.

* MDL is shown



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01384	18-04-1056-1-A	04/11/18 10:28	Air	GC 65	N/A	04/13/18 11:48	180413L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	14.9	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	6.29	0.500	0.205	1.00	
Nitrogen	78.8	0.500	0.477	1.00	

VSS01385	18-04-1056-2-A	04/11/18 10:25	Air	GC 65	N/A	04/13/18 12:09	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.48	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	14.0	0.500	0.205	1.00	
Nitrogen	78.6	0.500	0.477	1.00	

VSS01387	18-04-1056-4-A	04/12/18 10:00	Air	GC 65	N/A	04/13/18 12:36	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	14.4	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	7.55	0.500	0.205	1.00	
Nitrogen	78.0	0.500	0.477	1.00	

VSS01388	18-04-1056-5-A	04/12/18 10:00	Air	GC 65	N/A	04/13/18 13:06	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.62	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	14.2	0.500	0.205	1.00	
Nitrogen	78.2	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-16-444-766	N/A	Air	GC 65	N/A	04/13/18 10:57	180413L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01384	18-04-1056-1-A	04/11/18 10:28	Air	GC/MS ZZ	N/A	04/13/18 16:07	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	5000	29	100000	
Benzene	7500	50	8.5	100000	
Benzyl Chloride	ND	150	4.9	100000	
Bromodichloromethane	ND	50	6.2	100000	
Bromoform	ND	50	8.1	100000	
Bromomethane	ND	50	14	100000	
2-Butanone	ND	150	43	100000	
Carbon Disulfide	ND	1000	28	100000	
Carbon Tetrachloride	ND	50	6.2	100000	
Chlorobenzene	ND	50	6.8	100000	
Chloroethane	ND	50	24	100000	
Chloroform	ND	50	6.9	100000	
Chloromethane	ND	50	24	100000	
Dibromochloromethane	ND	50	5.5	100000	
Dichlorodifluoromethane	ND	50	6.0	100000	
1,1-Dichloroethane	ND	50	6.3	100000	
1,1-Dichloroethene	ND	50	20	100000	
1,2-Dibromoethane	ND	50	6.9	100000	
Dichlorotetrafluoroethane	ND	200	27	100000	
1,2-Dichlorobenzene	ND	50	5.3	100000	
1,2-Dichloroethane	ND	50	6.9	100000	
1,2-Dichloropropane	ND	50	19	100000	
1,3-Dichlorobenzene	ND	50	16	100000	
1,4-Dichlorobenzene	ND	50	6.7	100000	
c-1,3-Dichloropropene	ND	50	6.5	100000	
c-1,2-Dichloroethene	ND	50	8.7	100000	
t-1,2-Dichloroethene	ND	50	13	100000	
t-1,3-Dichloropropene	ND	100	6.9	100000	
Ethylbenzene	4800	50	14	100000	
4-Ethyltoluene	ND	50	16	100000	
Hexachloro-1,3-Butadiene	ND	150	10	100000	
2-Hexanone	ND	150	44	100000	
Methyl-t-Butyl Ether (MTBE)	ND	200	15	100000	
Methylene Chloride	ND	500	25	100000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	150	37	100000	
o-Xylene	ND	50	16	100000	
p/m-Xylene	ND	200	33	100000	
Styrene	ND	150	6.4	100000	
Tetrachloroethene	ND	50	6.7	100000	
Toluene	85	500	13	100000	J
Trichloroethene	ND	50	6.9	100000	
Trichlorofluoromethane	ND	100	17	100000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	150	7.0	100000	
1,1,1-Trichloroethane	ND	50	7.9	100000	
1,1,2-Trichloroethane	ND	50	18	100000	
1,3,5-Trimethylbenzene	ND	50	14	100000	
1,1,2,2-Tetrachloroethane	ND	100	14	100000	
1,2,4-Trimethylbenzene	ND	150	15	100000	
1,2,4-Trichlorobenzene	ND	200	12	100000	
Vinyl Acetate	ND	200	9.8	100000	
Vinyl Chloride	ND	50	22	100000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	92	78-156	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01385	18-04-1056-2-A	04/11/18 10:25	Air	GC/MS ZZ	N/A	04/13/18 16:51	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	14	2500	14	50000	J
Benzene	3900	25	4.2	50000	
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	3200	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	75	19	50000	
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	50	250	6.7	50000	J
Trichloroethene	9.3	25	3.5	50000	J
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	93	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01386	18-04-1056-3-A	04/11/18 10:30	Air	GC/MS ZZ	N/A	04/13/18 17:35	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	200	1.1	4000	
Benzene	81	2.0	0.34	4000	
Benzyl Chloride	ND	6.0	0.20	4000	
Bromodichloromethane	ND	2.0	0.25	4000	
Bromoform	ND	2.0	0.32	4000	
Bromomethane	ND	2.0	0.55	4000	
2-Butanone	ND	6.0	1.7	4000	
Carbon Disulfide	ND	40	1.1	4000	
Carbon Tetrachloride	ND	2.0	0.25	4000	
Chlorobenzene	ND	2.0	0.27	4000	
Chloroethane	ND	2.0	0.96	4000	
Chloroform	ND	2.0	0.28	4000	
Chloromethane	ND	2.0	0.96	4000	
Dibromochloromethane	ND	2.0	0.22	4000	
Dichlorodifluoromethane	ND	2.0	0.24	4000	
1,1-Dichloroethane	ND	2.0	0.25	4000	
1,1-Dichloroethene	ND	2.0	0.80	4000	
1,2-Dibromoethane	ND	2.0	0.28	4000	
Dichlorotetrafluoroethane	ND	8.0	1.1	4000	
1,2-Dichlorobenzene	ND	2.0	0.21	4000	
1,2-Dichloroethane	ND	2.0	0.27	4000	
1,2-Dichloropropane	ND	2.0	0.76	4000	
1,3-Dichlorobenzene	ND	2.0	0.65	4000	
1,4-Dichlorobenzene	ND	2.0	0.27	4000	
c-1,3-Dichloropropene	ND	2.0	0.26	4000	
c-1,2-Dichloroethene	ND	2.0	0.35	4000	
t-1,2-Dichloroethene	ND	2.0	0.51	4000	
t-1,3-Dichloropropene	ND	4.0	0.28	4000	
Ethylbenzene	310	2.0	0.58	4000	
4-Ethyltoluene	ND	2.0	0.64	4000	
Hexachloro-1,3-Butadiene	ND	6.0	0.41	4000	
2-Hexanone	ND	6.0	1.8	4000	
Methyl-t-Butyl Ether (MTBE)	ND	8.0	0.61	4000	
Methylene Chloride	ND	20	0.99	4000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	6.0	1.5	4000	
o-Xylene	ND	2.0	0.63	4000	
p/m-Xylene	ND	8.0	1.3	4000	
Styrene	ND	6.0	0.25	4000	
Tetrachloroethene	ND	2.0	0.27	4000	
Toluene	2.4	20	0.54	4000	J
Trichloroethene	ND	2.0	0.28	4000	
Trichlorofluoromethane	ND	4.0	0.68	4000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	6.0	0.28	4000	
1,1,1-Trichloroethane	ND	2.0	0.32	4000	
1,1,2-Trichloroethane	ND	2.0	0.73	4000	
1,3,5-Trimethylbenzene	ND	2.0	0.58	4000	
1,1,2,2-Tetrachloroethane	ND	4.0	0.55	4000	
1,2,4-Trimethylbenzene	ND	6.0	0.61	4000	
1,2,4-Trichlorobenzene	ND	8.0	0.50	4000	
Vinyl Acetate	ND	8.0	0.39	4000	
Vinyl Chloride	ND	2.0	0.89	4000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	92	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01387	18-04-1056-4-A	04/12/18 10:00	Air	GC/MS ZZ	N/A	04/13/18 18:19	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	5000	29	100000	
Benzene	7200	50	8.5	100000	
Benzyl Chloride	ND	150	4.9	100000	
Bromodichloromethane	ND	50	6.2	100000	
Bromoform	ND	50	8.1	100000	
Bromomethane	ND	50	14	100000	
2-Butanone	ND	150	43	100000	
Carbon Disulfide	ND	1000	28	100000	
Carbon Tetrachloride	ND	50	6.2	100000	
Chlorobenzene	ND	50	6.8	100000	
Chloroethane	ND	50	24	100000	
Chloroform	ND	50	6.9	100000	
Chloromethane	ND	50	24	100000	
Dibromochloromethane	ND	50	5.5	100000	
Dichlorodifluoromethane	ND	50	6.0	100000	
1,1-Dichloroethane	ND	50	6.3	100000	
1,1-Dichloroethene	ND	50	20	100000	
1,2-Dibromoethane	ND	50	6.9	100000	
Dichlorotetrafluoroethane	ND	200	27	100000	
1,2-Dichlorobenzene	ND	50	5.3	100000	
1,2-Dichloroethane	ND	50	6.9	100000	
1,2-Dichloropropane	ND	50	19	100000	
1,3-Dichlorobenzene	ND	50	16	100000	
1,4-Dichlorobenzene	ND	50	6.7	100000	
c-1,3-Dichloropropene	ND	50	6.5	100000	
c-1,2-Dichloroethene	ND	50	8.7	100000	
t-1,2-Dichloroethene	ND	50	13	100000	
t-1,3-Dichloropropene	ND	100	6.9	100000	
Ethylbenzene	5900	50	14	100000	
4-Ethyltoluene	ND	50	16	100000	
Hexachloro-1,3-Butadiene	ND	150	10	100000	
2-Hexanone	ND	150	44	100000	
Methyl-t-Butyl Ether (MTBE)	ND	200	15	100000	
Methylene Chloride	ND	500	25	100000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 8 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	150	37	100000	
o-Xylene	ND	50	16	100000	
p/m-Xylene	ND	200	33	100000	
Styrene	ND	150	6.4	100000	
Tetrachloroethene	ND	50	6.7	100000	
Toluene	87	500	13	100000	J
Trichloroethene	ND	50	6.9	100000	
Trichlorofluoromethane	ND	100	17	100000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	150	7.0	100000	
1,1,1-Trichloroethane	ND	50	7.9	100000	
1,1,2-Trichloroethane	ND	50	18	100000	
1,3,5-Trimethylbenzene	ND	50	14	100000	
1,1,2,2-Tetrachloroethane	ND	100	14	100000	
1,2,4-Trimethylbenzene	ND	150	15	100000	
1,2,4-Trichlorobenzene	ND	200	12	100000	
Vinyl Acetate	ND	200	9.8	100000	
Vinyl Chloride	ND	50	22	100000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	103	47-137	
Toluene-d8	93	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 9 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01388	18-04-1056-5-A	04/12/18 10:00	Air	GC/MS ZZ	N/A	04/13/18 19:47	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	18	2500	14	50000	J
Benzene	4100	25	4.2	50000	
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	3400	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 10 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	75	19	50000	
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	54	250	6.7	50000	J
Trichloroethene	4.0	25	3.5	50000	J
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	99	57-129	
1,2-Dichloroethane-d4	99	47-137	
Toluene-d8	93	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 11 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01389	18-04-1056-6-A	04/12/18 10:05	Air	GC/MS ZZ	N/A	04/14/18 02:43	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	80	0.46	1600	
Benzene	64	0.80	0.14	1600	
Benzyl Chloride	ND	2.4	0.078	1600	
Bromodichloromethane	ND	0.80	0.099	1600	
Bromoform	ND	0.80	0.13	1600	
Bromomethane	ND	0.80	0.22	1600	
2-Butanone	ND	2.4	0.69	1600	
Carbon Disulfide	ND	16	0.44	1600	
Carbon Tetrachloride	ND	0.80	0.099	1600	
Chlorobenzene	ND	0.80	0.11	1600	
Chloroethane	ND	0.80	0.39	1600	
Chloroform	ND	0.80	0.11	1600	
Chloromethane	ND	0.80	0.38	1600	
Dibromochloromethane	ND	0.80	0.088	1600	
Dichlorodifluoromethane	ND	0.80	0.095	1600	
1,1-Dichloroethane	ND	0.80	0.10	1600	
1,1-Dichloroethene	ND	0.80	0.32	1600	
1,2-Dibromoethane	ND	0.80	0.11	1600	
Dichlorotetrafluoroethane	ND	3.2	0.42	1600	
1,2-Dichlorobenzene	ND	0.80	0.085	1600	
1,2-Dichloroethane	ND	0.80	0.11	1600	
1,2-Dichloropropane	ND	0.80	0.31	1600	
1,3-Dichlorobenzene	ND	0.80	0.26	1600	
1,4-Dichlorobenzene	ND	0.80	0.11	1600	
c-1,3-Dichloropropene	ND	0.80	0.10	1600	
c-1,2-Dichloroethene	ND	0.80	0.14	1600	
t-1,2-Dichloroethene	ND	0.80	0.20	1600	
t-1,3-Dichloropropene	ND	1.6	0.11	1600	
Ethylbenzene	180	0.80	0.23	1600	E
4-Ethyltoluene	ND	0.80	0.25	1600	
Hexachloro-1,3-Butadiene	ND	2.4	0.16	1600	
2-Hexanone	ND	2.4	0.70	1600	
Methyl-t-Butyl Ether (MTBE)	ND	3.2	0.24	1600	
Methylene Chloride	ND	8.0	0.40	1600	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 12 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	2.4	0.60	1600	
o-Xylene	ND	0.80	0.25	1600	
p/m-Xylene	ND	3.2	0.53	1600	
Styrene	ND	2.4	0.10	1600	
Tetrachloroethene	ND	0.80	0.11	1600	
Toluene	1.7	8.0	0.22	1600	J
Trichloroethene	0.11	0.80	0.11	1600	J
Trichlorofluoromethane	ND	1.6	0.27	1600	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	2.4	0.11	1600	
1,1,1-Trichloroethane	ND	0.80	0.13	1600	
1,1,2-Trichloroethane	ND	0.80	0.29	1600	
1,3,5-Trimethylbenzene	ND	0.80	0.23	1600	
1,1,2,2-Tetrachloroethane	ND	1.6	0.22	1600	
1,2,4-Trimethylbenzene	ND	2.4	0.25	1600	
1,2,4-Trichlorobenzene	ND	3.2	0.20	1600	
Vinyl Acetate	ND	3.2	0.16	1600	
Vinyl Chloride	ND	0.80	0.36	1600	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	103	57-129	
1,2-Dichloroethane-d4	110	47-137	
Toluene-d8	98	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01389	18-04-1056-6-A	04/12/18 10:05	Air	GC/MS ZZ	N/A	04/13/18 20:31	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethylbenzene	130	2.0	0.58	4000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	94	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 13 of 14

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8453	N/A	Air	GC/MS ZZ	N/A	04/13/18 15:16	180413L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 14 of 14

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	96	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01384	18-04-1056-1-A	04/11/18 10:28	Air	GC 13	N/A	04/12/18 21:28	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	16000	75	21	50.0	

VSS01385	18-04-1056-2-A	04/11/18 10:25	Air	GC 13	N/A	04/12/18 21:48	180412L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	8900	75	21	50.0	

VSS01386	18-04-1056-3-A	04/11/18 10:30	Air	GC 13	N/A	04/12/18 20:59	180412L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	570	3.8	1.1	2.50	

VSS01387	18-04-1056-4-A	04/12/18 10:00	Air	GC 13	N/A	04/13/18 10:56	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	15000	75	21	50.0	

VSS01388	18-04-1056-5-A	04/12/18 10:00	Air	GC 13	N/A	04/13/18 11:44	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	8500	75	21	50.0	

VSS01389	18-04-1056-6-A	04/12/18 10:05	Air	GC 13	N/A	04/12/18 21:08	180412L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	540	3.8	1.1	2.50	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	098-01-005-8409	N/A	Air	GC 13	N/A	04/12/18 10:09	180412L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	ND	1.5	0.43	1.00	

Method Blank	098-01-005-8411	N/A	Air	GC 13	N/A	04/13/18 10:08	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	ND	1.5	0.43	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01384	18-04-1056-1-A	04/11/18 10:28	Air	GC 14	N/A	04/18/18 19:52	180418L04

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	270	1.0	0.21	1.00	

VSS01385	18-04-1056-2-A	04/11/18 10:25	Air	GC 14	N/A	04/18/18 20:09	180418L04
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	130	1.0	0.21	1.00	

VSS01387	18-04-1056-4-A	04/12/18 10:00	Air	GC 14	N/A	04/18/18 20:27	180418L04
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	140	1.0	0.21	1.00	

VSS01388	18-04-1056-5-A	04/12/18 10:00	Air	GC 14	N/A	04/18/18 20:44	180418L04
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	76	1.0	0.21	1.00	

Method Blank	099-07-024-1543	N/A	Air	GC 14	N/A	04/18/18 19:28	180418L04
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Methane	ND	1.0	0.21	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/12/18 Work Order: 18-04-1056 Preparation: N/A Method: EPA TO-3M Page 1 of 2
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
18-04-1014-1	Sample	Air	GC 13	N/A	04/12/18 19:41	180412D02
18-04-1014-1	Sample Duplicate	Air	GC 13	N/A	04/12/18 19:54	180412D02
<u>Parameter</u>	<u>Sample Conc.</u>		<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	556.1		545.8	2	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/12/18 Work Order: 18-04-1056 Preparation: N/A Method: EPA TO-3M Page 2 of 2
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
VSS01387	Sample	Air	GC 13	N/A	04/13/18 10:56	180413D01
VSS01387	Sample Duplicate	Air	GC 13	N/A	04/13/18 11:08	180413D01
<u>Parameter</u>	<u>Sample Conc.</u>		<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	15460		15350	1	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 7

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-766	LCS	Air	GC 65	N/A	04/13/18 10:15	180413L01			
099-16-444-766	LCSD	Air	GC 65	N/A	04/13/18 10:36	180413L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	14.98	100	15.08	100	80-120	1	0-30	
Carbon Monoxide	7.020	6.746	96	6.752	96	80-120	0	0-30	
Oxygen (+ Argon)	3.990	3.918	98	3.859	97	80-120	2	0-30	
Nitrogen	69.45	64.74	93	64.54	93	80-120	0	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 7

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-12-981-8453	LCS	Air	GC/MS ZZ	N/A	04/13/18 12:29	180413L02				
099-12-981-8453	LCSD	Air	GC/MS ZZ	N/A	04/13/18 13:19	180413L02				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02377	95	0.02400	96	50-150	33-167	1	0-35	
Benzene	0.02500	0.02272	91	0.02298	92	60-156	44-172	1	0-40	
Benzyl Chloride	0.02500	0.02924	117	0.02963	119	50-150	33-167	1	0-35	
Bromodichloromethane	0.02500	0.02579	103	0.02571	103	50-150	33-167	0	0-35	
Bromoform	0.02500	0.03053	122	0.03073	123	50-150	33-167	1	0-38	
Bromomethane	0.02500	0.02824	113	0.02782	111	50-150	33-167	1	0-35	
2-Butanone	0.02500	0.02268	91	0.02279	91	50-150	33-167	0	0-35	
Carbon Disulfide	0.02500	0.02332	93	0.02344	94	50-150	33-167	1	0-35	
Carbon Tetrachloride	0.02500	0.02773	111	0.02752	110	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02533	101	0.02570	103	50-150	33-167	1	0-35	
Chloroethane	0.02500	0.02780	111	0.02728	109	50-150	33-167	2	0-35	
Chloroform	0.02500	0.02413	97	0.02408	96	50-150	33-167	0	0-35	
Chloromethane	0.02500	0.02759	110	0.02729	109	50-150	33-167	1	0-35	
Dibromochloromethane	0.02500	0.02756	110	0.02767	111	50-150	33-167	0	0-35	
Dichlorodifluoromethane	0.02500	0.02926	117	0.02838	114	50-150	33-167	3	0-35	
1,1-Dichloroethane	0.02500	0.02311	92	0.02323	93	50-150	33-167	0	0-35	
1,1-Dichloroethene	0.02500	0.02419	97	0.02420	97	50-150	33-167	0	0-35	
1,2-Dibromoethane	0.02500	0.02599	104	0.02621	105	54-144	39-159	1	0-36	
Dichlorotetrafluoroethane	0.02500	0.03010	120	0.02943	118	50-150	33-167	2	0-35	
1,2-Dichlorobenzene	0.02500	0.02879	115	0.02930	117	34-160	13-181	2	0-47	
1,2-Dichloroethane	0.02500	0.02468	99	0.02462	98	69-153	55-167	0	0-35	
1,2-Dichloropropane	0.02500	0.02312	92	0.02340	94	67-157	52-172	1	0-35	
1,3-Dichlorobenzene	0.02500	0.02919	117	0.02963	119	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02936	117	0.02974	119	36-156	16-176	1	0-47	
c-1,3-Dichloropropene	0.02500	0.02470	99	0.02502	100	61-157	45-173	1	0-35	
c-1,2-Dichloroethene	0.02500	0.02331	93	0.02358	94	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02346	94	0.02360	94	50-150	33-167	1	0-35	
t-1,3-Dichloropropene	0.02500	0.02595	104	0.02606	104	50-150	33-167	0	0-35	
Ethylbenzene	0.02500	0.02572	103	0.02600	104	52-154	35-171	1	0-38	
4-Ethyltoluene	0.02500	0.02690	108	0.02710	108	50-150	33-167	1	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.03681	147	0.03697	148	50-150	33-167	0	0-35	
2-Hexanone	0.02500	0.02392	96	0.02440	98	50-150	33-167	2	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02067	83	0.02131	85	50-150	33-167	3	0-35	
Methylene Chloride	0.02500	0.02377	95	0.02386	95	50-150	33-167	0	0-35	
4-Methyl-2-Pentanone	0.02500	0.02344	94	0.02409	96	50-150	33-167	3	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 7

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
o-Xylene	0.02500	0.02511	100	0.02532	101	52-148	36-164	1	0-38	
p/m-Xylene	0.05000	0.05380	108	0.05408	108	42-156	23-175	1	0-41	
Styrene	0.02500	0.02478	99	0.02521	101	50-150	33-167	2	0-35	
Tetrachloroethene	0.02500	0.02674	107	0.02695	108	56-152	40-168	1	0-40	
Toluene	0.02500	0.02352	94	0.02376	95	56-146	41-161	1	0-43	
Trichloroethene	0.02500	0.02538	102	0.02538	102	63-159	47-175	0	0-34	
Trichlorofluoromethane	0.02500	0.02504	100	0.02489	100	50-150	33-167	1	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02539	102	0.02537	101	50-150	33-167	0	0-35	
1,1,1-Trichloroethane	0.02500	0.02506	100	0.02505	100	50-150	33-167	0	0-35	
1,1,2-Trichloroethane	0.02500	0.02472	99	0.02485	99	65-149	51-163	1	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02738	110	0.02775	111	50-150	33-167	1	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02568	103	0.02607	104	50-150	33-167	2	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02856	114	0.02893	116	50-150	33-167	1	0-35	
1,2,4-Trichlorobenzene	0.02500	0.03520	141	0.03568	143	50-150	33-167	1	0-35	
Vinyl Acetate	0.02500	0.02199	88	0.02193	88	50-150	33-167	0	0-35	
Vinyl Chloride	0.02500	0.02786	111	0.02760	110	45-177	23-199	1	0-36	

Total number of LCS compounds: 51

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 7

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8453	LCS	Air	GC/MS ZZ	N/A	04/13/18 12:29	180413L02	
099-12-981-8453	LCSD	Air	GC/MS ZZ	N/A	04/13/18 13:19	180413L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02504	100	0.02484	99	57-129	
1,2-Dichloroethane-d4	0.02500	0.02520	101	0.02480	99	47-137	
Toluene-d8	0.02500	0.02446	98	0.02431	97	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: EPA TO-3M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 7

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8409	LCS	Air	GC 13	N/A	04/12/18 09:42	180412L02
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	192.5	96	80-120	

Return to Contents



Calscience

Quality Control - LCS

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/12/18 Work Order: 18-04-1056 Preparation: N/A Method: EPA TO-3M Page 6 of 7
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8411	LCS	Air	GC 13	N/A	04/13/18 09:47	180413L01
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	196.7	98	80-120	

[Return to Contents](#)



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/12/18
Work Order: 18-04-1056
Preparation: N/A
Method: SCAQMD 25.1M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 7 of 7

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1543	LCS	Air	GC 14	N/A	04/18/18 18:58	180418L04			
099-07-024-1543	LCSD	Air	GC 14	N/A	04/18/18 19:12	180418L04			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	101.0	91.88	91	91.85	91	80-120	0	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Sample Analysis Summary Report

Work Order: 18-04-1056

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	1145	GC 65	2
EPA TO-15M	N/A	1087	GC/MS ZZ	2
EPA TO-3M	N/A	748	GC 13	2
EPA TO-3M	N/A	1145	GC 13	2
SCAQMD 25.1M	N/A	1145	GC 14	2


Return to Contents

Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

Glossary of Terms and Qualifiers

Work Order: 18-04-1056

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

LAB (LOCATION)

☐ ACCUTEST ()
☒ CALSCIENCE ()
☐ TESTAMERICA ()
☐ Other ()

Lab Vendor # 1080777 (CalScience)



Shell Oil Products US Chain Of Custody Record

AECOM

Please Check Appropriate Box: <input checked="" type="checkbox"/> SGW FDG <input type="checkbox"/> MOTIVA RETAIL <input type="checkbox"/> SHELL RETAIL <input type="checkbox"/> MOTIVA SD&CM <input type="checkbox"/> CONSULTANT <input type="checkbox"/> LUBES <input type="checkbox"/> SHELL PIPELINE <input type="checkbox"/> OTHER		Print Bill To Contact Name: Julie Doane-Allmon PO # 964833 AECOM Project Task Number: 60566446.2018.1.0601 E-MAIL: steve.j.cole@aecom.com		PlanNet Project ID: IDEAA000680 GSAP Project ID: USCH/00305		DATE: 4/12/18 PAGE: 1 of 1	
ADDRESS: 130 Robin Hill Road, Suite 100, Santa Barbara CA, 93117 PROJECT CONTACT (Hardcopy or PDF Report to): Julie Doane-Allmon TELEPHONE: 805-692-0618 FAX: 805-964-0269 BILL TO CONTACT E-MAIL: julie.doane-allmon@aecom.com		SITE ADDRESS: Street and City: Del Amo Superfund Site, 20245 S. Vermont Ave., Torrance STATE: CA PHONE NO.: Direct: 213-996-2398 E-MAIL: steve.j.cole@aecom.com 300 S. Grand Ave., Ste. 800, LA, CA 90071 AECOM Steve Cole 18-04-1056		AECOM Project Task Number: 60566446.2018.1.0601 CONSULTANT PROJECT NO.:		LAB USE ONLY: 18-04-1056	
TURNAROUND TIME (CALENDAR DAYS): <input checked="" type="checkbox"/> STANDARD (14 DAY) <input type="checkbox"/> 3 DAYS <input type="checkbox"/> 2 DAYS <input type="checkbox"/> 24 HOURS <input type="checkbox"/> RESULTS NEEDED ON WEEKEND		LA - RWQCB REPORT FORMAT <input type="checkbox"/> UST AGENCY:		DELIVERABLES: <input type="checkbox"/> LEVEL 1 <input type="checkbox"/> LEVEL 2 <input checked="" type="checkbox"/> LEVEL 4 <input type="checkbox"/> OTHER (SPECIFY)		SPECIAL INSTRUCTIONS OR NOTES: <input checked="" type="checkbox"/> SHELL CONTRACT RATE APPLIES <input type="checkbox"/> STATE REIMBURSEMENT RATE APPLIES <input type="checkbox"/> EDD NOT NEEDED <input checked="" type="checkbox"/> RECEIPT VERIFICATION REQUESTED <input type="checkbox"/> PROVIDE LEDD DISK	
TEMPERATURE ON RECEIPT C° Cooler #1 Cooler #2 Cooler #3		FIELD NOTES:		TEMPERATURE ON RECEIPT C°		Container PID Readings or Laboratory Notes	

LAB USE ONLY	Field Sample Identification		SAMPLING DATE	TIME	MATRIX	PRESERVATIVE				NO. OF CONT.	REQUESTED ANALYSIS	UNIT COST	NON-UNIT COST	FIELD NOTES:	
	DATE	TIME				HCL	HNO3	H2SO4	NONE						OTHER
1	VSS 01384		4/11/18	1028	air				X		1				
2	VSS 01385		4/11/18	1025	air				X		1				
3	VSS 01386		4/11/18	1030	air				X		1				
4	VSS 01387		4/12/18	1000	air				X		1				
5	VSS 01388		4/12/18	1050	air				X		1				
6	VSS 01389		4/12/18	1005	air				X		1				

Relinquished by: (Signature) <i>Paul D. Jones</i>	Received by: (Signature) <i>Jeff Chandler</i>	Date: 4/12/18	Time: 1425
Relinquished by: (Signature) <i>Paul D. Jones</i>	Received by: (Signature) <i>Jeff Chandler</i>	Date: 4/12/18	Time: 1815
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0CLIENT: AecomDATE: 04/12/2018**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): _____ °C (w/ CF): _____ °C; ☐ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☒ Air ☐ FilterChecked by: 1091**CUSTODY SEAL:**Cooler ☐ Present and Intact ☐ Present but Not Intact ☐ Not Present ☒ N/AChecked by: 1091Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/AChecked by: 300**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH__9)☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH__2) ☐ 250PB ☐ 250PB_n (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s (pH__2) ☐ 500PB☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s (pH__2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH__12) ☐ _____ ☐ _____ ☐ _____Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____Air: ☒ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 300s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, znna = Zn (CH₃CO₂)₂ + NaOHReviewed by: 300



Supplemental Report 3

The original report has been revised/corrected.

**WORK ORDER NUMBER: 18-04-1122***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** AECOM**Client Project Name:** Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601**Attention:** Julie Doane-Allmon
130 Robin Hill Road
Suite 100
Santa Barbara, CA 93117-3153*Vikas Patel*Approved for release on 06/20/2018 by:
Vikas Patel
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
 Work Order Number: 18-04-1122

1	Work Order Narrative.	3
2	Sample Summary.	4
3	QC Association Summary.	5
4	Detections Summary.	6
5	Client Sample Data.	7
	5.1 ASTM D-1946 Fixed Gases (Air).	7
	5.2 EPA TO-15 (M) Full List (Air).	8
	5.3 EPA TO-15 (M) Full List + Oxygenates (Air).	14
	5.4 EPA TO-3 (M) TPH Gasoline (Air).	20
	5.5 SCAQMD 25.1 TGNMO and CH4 (Air).	21
6	Quality Control Sample Data.	22
	6.1 Sample Duplicate.	22
	6.2 LCS/LCSD.	23
7	Sample Analysis Summary.	29
8	Glossary of Terms and Qualifiers.	30
9	Chain-of-Custody/Sample Receipt Form.	31

Work Order Narrative

Work Order: 18-04-1122

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/13/18. They were assigned to Work Order 18-04-1122.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



Calscience

Sample Summary

Client: AECOM	Work Order: 18-04-1122
130 Robin Hill Road, Suite 100	Project Name: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601
Santa Barbara, CA 93117-3153	PO Number: 100067
	Date/Time Received: 04/13/18 13:30
	Number of Containers: 3

Attn: Julie Doane-Allmon

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VSS01390	18-04-1122-1	04/13/18 11:45	1	Air
VSS01391	18-04-1122-2	04/13/18 11:51	1	Air
VSS01392	18-04-1122-3	04/13/18 11:46	1	Air


Return to Contents

QC Association Summary

Work Order: 18-04-1122

Page 1 of 1

<u>Client Sample ID</u>	<u>Method Name</u>	<u>Type</u>	<u>Ext Name</u>	<u>Instrument</u>	<u>MS/MSD/SDP</u>	<u>LCS/LCSD</u>
VSS01390	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01390	EPA TO-15 (M) Full List + Oxygenates		N/A	GC/MS OOO	*2	180414L02
VSS01390	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180413D01	180413L01
VSS01390	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L02
VSS01391	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180414L02
VSS01391	EPA TO-15 (M) Full List	R	N/A	GC/MS OOO	*1	180414L02
VSS01391	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180413D01	180413L01
VSS01392	ASTM D-1946 Fixed Gases		N/A	GC 65	*2	180413L01
VSS01392	EPA TO-15 (M) Full List		N/A	GC/MS OOO	*2	180414L02
VSS01392	EPA TO-3 (M) TPH Gasoline		N/A	GC 13	180413D01	180413L01
VSS01392	SCAQMD 25.1 TGNMO and CH4		N/A	GC 14	*2	180418L02

1 = Dilution analysis performed, no associated matrix QC

2 = Limited sample received, no MS/MSD performed

R = Rerun



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Detections Summary

Client: AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Work Order: 18-04-1122
Project Name: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601
Received: 04/13/18

Attn: Julie Doane-Allmon

Page 1 of 1

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
VSS01390 (18-04-1122-1)						
Carbon Dioxide	13.8		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	8.40		0.500	%v	ASTM D-1946	N/A
Nitrogen	77.8		0.500	%v	ASTM D-1946	N/A
Acetone	29	J	29*	ppm (v/v)	EPA TO-15M	N/A
Benzene	4800		50	ppm (v/v)	EPA TO-15M	N/A
Cyclohexane	30	J	16*	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1900		50	ppm (v/v)	EPA TO-15M	N/A
Heptane	320		200	ppm (v/v)	EPA TO-15M	N/A
Tetrachloroethene	16	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
Toluene	43	J	13*	ppm (v/v)	EPA TO-15M	N/A
Methanol	190	J	130*	ppm (v/v)	EPA TO-15M	N/A
Isopropanol	62	J	25*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	15000		100	ppm (v/v)	EPA TO-3M	N/A
Methane	82		1.0	ppm (v/v)	SCAQMD 25.1M	N/A
VSS01391 (18-04-1122-2)						
Acetone	0.36	J	0.11*	ppm (v/v)	EPA TO-15M	N/A
Benzene	19		0.20	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	39		1.0	ppm (v/v)	EPA TO-15M	N/A
Tetrachloroethene	0.029	J	0.027*	ppm (v/v)	EPA TO-15M	N/A
Toluene	0.50	J	0.054*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	220		2.0	ppm (v/v)	EPA TO-3M	N/A
VSS01392 (18-04-1122-3)						
Carbon Dioxide	7.09		0.500	%v	ASTM D-1946	N/A
Oxygen (+ Argon)	14.8		0.500	%v	ASTM D-1946	N/A
Nitrogen	78.1		0.500	%v	ASTM D-1946	N/A
Acetone	20	J	14*	ppm (v/v)	EPA TO-15M	N/A
Benzene	2600		25	ppm (v/v)	EPA TO-15M	N/A
Ethylbenzene	1300		25	ppm (v/v)	EPA TO-15M	N/A
Toluene	25	J	6.7*	ppm (v/v)	EPA TO-15M	N/A
TPH as Gasoline	8900		100	ppm (v/v)	EPA TO-3M	N/A
Methane	45		1.0	ppm (v/v)	SCAQMD 25.1M	N/A

Subcontracted analyses, if any, are not included in this summary.

* MDL is shown



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01390	18-04-1122-1-A	04/13/18 11:45	Air	GC 65	N/A	04/13/18 20:41	180413L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	13.8	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	8.40	0.500	0.205	1.00	
Nitrogen	77.8	0.500	0.477	1.00	

VSS01392	18-04-1122-3-A	04/13/18 11:46	Air	GC 65	N/A	04/13/18 21:02	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	7.09	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	14.8	0.500	0.205	1.00	
Nitrogen	78.1	0.500	0.477	1.00	

Method Blank	099-16-444-766	N/A	Air	GC 65	N/A	04/13/18 10:57	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon Dioxide	ND	0.500	0.139	1.00	
Carbon Monoxide	ND	0.500	0.183	1.00	
Oxygen (+ Argon)	ND	0.500	0.205	1.00	
Nitrogen	ND	0.500	0.477	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01391	18-04-1122-2-A	04/13/18 11:51	Air	GC/MS OOO	N/A	04/15/18 01:39	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	0.36	20	0.11	400	J
Benzene	19	0.20	0.034	400	
Benzyl Chloride	ND	0.60	0.020	400	
Bromodichloromethane	ND	0.20	0.025	400	
Bromoform	ND	0.20	0.032	400	
Bromomethane	ND	0.20	0.055	400	
2-Butanone	ND	0.60	0.17	400	
Carbon Disulfide	ND	4.0	0.11	400	
Carbon Tetrachloride	ND	0.20	0.025	400	
Chlorobenzene	ND	0.20	0.027	400	
Chloroethane	ND	0.20	0.096	400	
Chloroform	ND	0.20	0.028	400	
Chloromethane	ND	0.20	0.096	400	
Dibromochloromethane	ND	0.20	0.022	400	
Dichlorodifluoromethane	ND	0.20	0.024	400	
1,1-Dichloroethane	ND	0.20	0.025	400	
1,1-Dichloroethene	ND	0.20	0.080	400	
1,2-Dibromoethane	ND	0.20	0.028	400	
Dichlorotetrafluoroethane	ND	0.80	0.11	400	
1,2-Dichlorobenzene	ND	0.20	0.021	400	
1,2-Dichloroethane	ND	0.20	0.027	400	
1,2-Dichloropropane	ND	0.20	0.076	400	
1,3-Dichlorobenzene	ND	0.20	0.065	400	
1,4-Dichlorobenzene	ND	0.20	0.027	400	
c-1,3-Dichloropropene	ND	0.20	0.026	400	
c-1,2-Dichloroethene	ND	0.20	0.035	400	
t-1,2-Dichloroethene	ND	0.20	0.051	400	
t-1,3-Dichloropropene	ND	0.40	0.028	400	
4-Ethyltoluene	ND	0.20	0.064	400	
Hexachloro-1,3-Butadiene	ND	0.60	0.041	400	
2-Hexanone	ND	0.60	0.18	400	
Methyl-t-Butyl Ether (MTBE)	ND	0.80	0.061	400	
Methylene Chloride	ND	2.0	0.099	400	
4-Methyl-2-Pentanone	ND	0.60	0.15	400	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
o-Xylene	ND	0.20	0.063	400	
p/m-Xylene	ND	0.80	0.13	400	
Styrene	ND	0.60	0.025	400	
Tetrachloroethene	0.029	0.20	0.027	400	J
Toluene	0.50	2.0	0.054	400	J
Trichloroethene	ND	0.20	0.028	400	
Trichlorofluoromethane	ND	0.40	0.068	400	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.60	0.028	400	
1,1,1-Trichloroethane	ND	0.20	0.032	400	
1,1,2-Trichloroethane	ND	0.20	0.073	400	
1,3,5-Trimethylbenzene	ND	0.20	0.058	400	
1,1,2,2-Tetrachloroethane	ND	0.40	0.055	400	
1,2,4-Trimethylbenzene	ND	0.60	0.061	400	
1,2,4-Trichlorobenzene	ND	0.80	0.050	400	
Vinyl Acetate	ND	0.80	0.039	400	
Vinyl Chloride	ND	0.20	0.089	400	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	100	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	100	78-156	

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Date/Time Collected</u>	<u>Matrix</u>	<u>Instrument</u>	<u>Date Prepared</u>	<u>Date/Time Analyzed</u>	<u>QC Batch ID</u>
VSS01391	18-04-1122-2-A	04/13/18 11:51	Air	GC/MS OOO	N/A	04/15/18 02:30	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethylbenzene	39	1.0	0.29	2000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	96	57-129	
1,2-Dichloroethane-d4	101	47-137	
Toluene-d8	93	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01392	18-04-1122-3-A	04/13/18 11:46	Air	GC/MS OOO	N/A	04/15/18 03:16	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	20	2500	14	50000	J
Benzene	2600	25	4.2	50000	
Benzyl Chloride	ND	75	2.5	50000	
Bromodichloromethane	ND	25	3.1	50000	
Bromoform	ND	25	4.0	50000	
Bromomethane	ND	25	6.9	50000	
2-Butanone	ND	75	22	50000	
Carbon Disulfide	ND	500	14	50000	
Carbon Tetrachloride	ND	25	3.1	50000	
Chlorobenzene	ND	25	3.4	50000	
Chloroethane	ND	25	12	50000	
Chloroform	ND	25	3.5	50000	
Chloromethane	ND	25	12	50000	
Dibromochloromethane	ND	25	2.7	50000	
Dichlorodifluoromethane	ND	25	3.0	50000	
1,1-Dichloroethane	ND	25	3.2	50000	
1,1-Dichloroethene	ND	25	9.9	50000	
1,2-Dibromoethane	ND	25	3.4	50000	
Dichlorotetrafluoroethane	ND	100	13	50000	
1,2-Dichlorobenzene	ND	25	2.7	50000	
1,2-Dichloroethane	ND	25	3.4	50000	
1,2-Dichloropropane	ND	25	9.5	50000	
1,3-Dichlorobenzene	ND	25	8.1	50000	
1,4-Dichlorobenzene	ND	25	3.4	50000	
c-1,3-Dichloropropene	ND	25	3.3	50000	
c-1,2-Dichloroethene	ND	25	4.4	50000	
t-1,2-Dichloroethene	ND	25	6.4	50000	
t-1,3-Dichloropropene	ND	50	3.5	50000	
Ethylbenzene	1300	25	7.2	50000	
4-Ethyltoluene	ND	25	7.9	50000	
Hexachloro-1,3-Butadiene	ND	75	5.1	50000	
2-Hexanone	ND	75	22	50000	
Methyl-t-Butyl Ether (MTBE)	ND	100	7.6	50000	
Methylene Chloride	ND	250	12	50000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	75	19	50000	
o-Xylene	ND	25	7.8	50000	
p/m-Xylene	ND	100	17	50000	
Styrene	ND	75	3.2	50000	
Tetrachloroethene	ND	25	3.4	50000	
Toluene	25	250	6.7	50000	J
Trichloroethene	ND	25	3.5	50000	
Trichlorofluoromethane	ND	50	8.5	50000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	75	3.5	50000	
1,1,1-Trichloroethane	ND	25	3.9	50000	
1,1,2-Trichloroethane	ND	25	9.1	50000	
1,3,5-Trimethylbenzene	ND	25	7.2	50000	
1,1,2,2-Tetrachloroethane	ND	50	6.9	50000	
1,2,4-Trimethylbenzene	ND	75	7.7	50000	
1,2,4-Trichlorobenzene	ND	100	6.2	50000	
Vinyl Acetate	ND	100	4.9	50000	
Vinyl Chloride	ND	25	11	50000	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	101	57-129	
1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	101	78-156	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8459	N/A	Air	GC/MS OOO	N/A	04/14/18 14:46	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	106	47-137	
Toluene-d8	91	78-156	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01390	18-04-1122-1-A	04/13/18 11:45	Air	GC/MS OOO	N/A	04/15/18 00:54	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	29	5000	29	100000	J
Benzene	4800	50	8.5	100000	
Benzyl Chloride	ND	150	4.9	100000	
Bromodichloromethane	ND	50	6.2	100000	
Bromoform	ND	50	8.1	100000	
Bromomethane	ND	50	14	100000	
1,3-Butadiene	ND	150	33	100000	
2-Butanone	ND	150	43	100000	
Carbon Disulfide	ND	1000	28	100000	
Carbon Tetrachloride	ND	50	6.2	100000	
Chlorobenzene	ND	50	6.8	100000	
Chloroethane	ND	50	24	100000	
Chloroform	ND	50	6.9	100000	
Chloromethane	ND	50	24	100000	
Cyclohexane	30	50	16	100000	J
Dibromochloromethane	ND	50	5.5	100000	
Dichlorodifluoromethane	ND	50	6.0	100000	
Diisopropyl Ether (DIPE)	ND	200	6.5	100000	
1,1-Dichloroethane	ND	50	6.3	100000	
1,1-Dichloroethene	ND	50	20	100000	
1,2-Dibromoethane	ND	50	6.9	100000	
Dichlorotetrafluoroethane	ND	200	27	100000	
1,2-Dichlorobenzene	ND	50	5.3	100000	
1,2-Dichloroethane	ND	50	6.9	100000	
1,2-Dichloropropane	ND	50	19	100000	
1,3-Dichlorobenzene	ND	50	16	100000	
1,4-Dichlorobenzene	ND	50	6.7	100000	
1,4-Dioxane	ND	1000	42	100000	
c-1,3-Dichloropropene	ND	50	6.5	100000	
c-1,2-Dichloroethene	ND	50	8.7	100000	
t-1,2-Dichloroethene	ND	50	13	100000	
t-1,3-Dichloropropene	ND	100	6.9	100000	
Ethanol	ND	5000	87	100000	
Ethyl Acetate	ND	1000	61	100000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethyl-t-Butyl Ether (ETBE)	ND	200	5.7	100000	
Ethylbenzene	1900	50	14	100000	
4-Ethyltoluene	ND	50	16	100000	
Heptane	320	200	44	100000	
Hexachloro-1,3-Butadiene	ND	150	10	100000	
Hexane	ND	200	16	100000	
2-Hexanone	ND	150	44	100000	
Methyl-t-Butyl Ether (MTBE)	ND	200	15	100000	
Methylene Chloride	ND	500	25	100000	
4-Methyl-2-Pentanone	ND	150	37	100000	
o-Xylene	ND	50	16	100000	
p/m-Xylene	ND	200	33	100000	
Propene	ND	1000	25	100000	
Styrene	ND	150	6.4	100000	
Tert-Amyl-Methyl Ether (TAME)	ND	200	4.9	100000	
Tert-Butyl Alcohol (TBA)	ND	500	17	100000	
Tetrachloroethene	16	50	6.7	100000	J
Tetrahydrofuran	ND	150	31	100000	
Toluene	43	500	13	100000	J
Trichloroethene	ND	50	6.9	100000	
Trichlorofluoromethane	ND	100	17	100000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	150	7.0	100000	
1,1,1-Trichloroethane	ND	50	7.9	100000	
1,1,2-Trichloroethane	ND	50	18	100000	
1,2,3-Trichloropropane	ND	500	7.7	100000	
Acrolein	ND	500	28	100000	
Acrylonitrile	ND	100	40	100000	
Methyl Methacrylate	ND	50	11	100000	
Propane	ND	1500	47	100000	
Butane	ND	500	48	100000	
Methanol	190	5000	130	100000	J
2,2,4-Trimethyl Pentane	ND	50	6.7	100000	
Isobutane	ND	500	60	100000	
1,1,1,2-Tetrafluoroethane	ND	200	7.3	100000	
1,3,5-Trimethylbenzene	ND	50	14	100000	
1,1,2,2-Tetrachloroethane	ND	100	14	100000	
1,2,4-Trimethylbenzene	ND	150	15	100000	
1,2,4-Trichlorobenzene	ND	200	12	100000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Vinyl Acetate	ND	200	9.8	100000	
Vinyl Chloride	ND	50	22	100000	
1,1-Difluoroethane	ND	200	9.3	100000	
Isopropanol	62	5000	25	100000	J
Isopropylbenzene	ND	50	22	100000	
Naphthalene	ND	500	16	100000	
n-Butylbenzene	ND	50	33	100000	
n-Propylbenzene	ND	50	27	100000	
p-Isopropyltoluene	ND	50	26	100000	
sec-Butylbenzene	ND	50	25	100000	
tert-Butylbenzene	ND	50	26	100000	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>		
1,4-Bromofluorobenzene	101	57-129			
1,2-Dichloroethane-d4	101	47-137			
Toluene-d8	96	78-156			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-981-8459	N/A	Air	GC/MS OOO	N/A	04/14/18 14:46	180414L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	0.050	0.00029	1.00	
Benzene	ND	0.00050	0.000085	1.00	
Benzyl Chloride	ND	0.0015	0.000049	1.00	
Bromodichloromethane	ND	0.00050	0.000062	1.00	
Bromoform	ND	0.00050	0.000081	1.00	
Bromomethane	ND	0.00050	0.00014	1.00	
1,3-Butadiene	ND	0.0015	0.00033	1.00	
2-Butanone	ND	0.0015	0.00043	1.00	
Carbon Disulfide	ND	0.010	0.00028	1.00	
Carbon Tetrachloride	ND	0.00050	0.000062	1.00	
Chlorobenzene	ND	0.00050	0.000068	1.00	
Chloroethane	ND	0.00050	0.00024	1.00	
Chloroform	ND	0.00050	0.000069	1.00	
Chloromethane	ND	0.00050	0.00024	1.00	
Cyclohexane	ND	0.00050	0.00016	1.00	
Dibromochloromethane	ND	0.00050	0.000055	1.00	
Dichlorodifluoromethane	ND	0.00050	0.000060	1.00	
Diisopropyl Ether (DIPE)	ND	0.0020	0.000065	1.00	
1,1-Dichloroethane	ND	0.00050	0.000063	1.00	
1,1-Dichloroethene	ND	0.00050	0.00020	1.00	
1,2-Dibromoethane	ND	0.00050	0.000069	1.00	
Dichlorotetrafluoroethane	ND	0.0020	0.00027	1.00	
1,2-Dichlorobenzene	ND	0.00050	0.000053	1.00	
1,2-Dichloroethane	ND	0.00050	0.000069	1.00	
1,2-Dichloropropane	ND	0.00050	0.00019	1.00	
1,3-Dichlorobenzene	ND	0.00050	0.00016	1.00	
1,4-Dichlorobenzene	ND	0.00050	0.000067	1.00	
1,4-Dioxane	ND	0.010	0.00042	1.00	
c-1,3-Dichloropropene	ND	0.00050	0.000065	1.00	
c-1,2-Dichloroethene	ND	0.00050	0.000087	1.00	
t-1,2-Dichloroethene	ND	0.00050	0.00013	1.00	
t-1,3-Dichloropropene	ND	0.0010	0.000069	1.00	
Ethanol	ND	0.050	0.00087	1.00	
Ethyl Acetate	ND	0.010	0.00061	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Ethyl-t-Butyl Ether (ETBE)	ND	0.0020	0.000057	1.00	
Ethylbenzene	ND	0.00050	0.00014	1.00	
4-Ethyltoluene	ND	0.00050	0.00016	1.00	
Heptane	ND	0.0020	0.00044	1.00	
Hexachloro-1,3-Butadiene	ND	0.0015	0.00010	1.00	
Hexane	ND	0.0020	0.00016	1.00	
2-Hexanone	ND	0.0015	0.00044	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.0020	0.00015	1.00	
Methylene Chloride	ND	0.0050	0.00025	1.00	
4-Methyl-2-Pentanone	ND	0.0015	0.00037	1.00	
o-Xylene	ND	0.00050	0.00016	1.00	
p/m-Xylene	ND	0.0020	0.00033	1.00	
Propene	ND	0.010	0.00025	1.00	
Styrene	ND	0.0015	0.000064	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.0020	0.000049	1.00	
Tert-Butyl Alcohol (TBA)	ND	0.0050	0.00017	1.00	
Tetrachloroethene	ND	0.00050	0.000067	1.00	
Tetrahydrofuran	ND	0.0015	0.00031	1.00	
Toluene	ND	0.0050	0.00013	1.00	
Trichloroethene	ND	0.00050	0.000069	1.00	
Trichlorofluoromethane	ND	0.0010	0.00017	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.0015	0.000070	1.00	
1,1,1-Trichloroethane	ND	0.00050	0.000079	1.00	
1,1,2-Trichloroethane	ND	0.00050	0.00018	1.00	
1,2,3-Trichloropropane	ND	0.0050	0.000077	1.00	
Acrolein	ND	0.0050	0.00028	1.00	
Acrylonitrile	ND	0.0010	0.00040	1.00	
Methyl Methacrylate	ND	0.00050	0.00011	1.00	
Propane	ND	0.015	0.00047	1.00	
Butane	ND	0.0050	0.00048	1.00	
Methanol	ND	0.050	0.0013	1.00	
2,2,4-Trimethyl Pentane	ND	0.00050	0.000067	1.00	
Isobutane	ND	0.0050	0.00060	1.00	
1,1,1,2-Tetrafluoroethane	ND	0.0020	0.000073	1.00	
1,3,5-Trimethylbenzene	ND	0.00050	0.00014	1.00	
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00014	1.00	
1,2,4-Trimethylbenzene	ND	0.0015	0.00015	1.00	
1,2,4-Trichlorobenzene	ND	0.0020	0.00012	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 6

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Vinyl Acetate	ND	0.0020	0.000098	1.00	
Vinyl Chloride	ND	0.00050	0.00022	1.00	
1,1-Difluoroethane	ND	0.0020	0.000093	1.00	
Isopropanol	ND	0.050	0.00025	1.00	
Isopropylbenzene	ND	0.00050	0.00022	1.00	
Naphthalene	ND	0.0050	0.00016	1.00	
n-Butylbenzene	ND	0.00050	0.00033	1.00	
n-Propylbenzene	ND	0.00050	0.00027	1.00	
sec-Butylbenzene	ND	0.00050	0.00025	1.00	
tert-Butylbenzene	ND	0.00050	0.00026	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>		
1,4-Bromofluorobenzene	98	57-129			
1,2-Dichloroethane-d4	106	47-137			
Toluene-d8	91	78-156			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-3M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01390	18-04-1122-1-A	04/13/18 11:45	Air	GC 13	N/A	04/13/18 20:37	180413L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	15000	100	21	50.0	

VSS01391	18-04-1122-2-A	04/13/18 11:51	Air	GC 13	N/A	04/13/18 21:06	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	220	2.0	0.43	1.00	

VSS01392	18-04-1122-3-A	04/13/18 11:46	Air	GC 13	N/A	04/13/18 21:28	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	8900	100	21	50.0	

Method Blank	098-01-005-8411	N/A	Air	GC 13	N/A	04/13/18 10:08	180413L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
TPH as Gasoline	ND	2.0	0.43	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: SCAQMD 25.1M
Units: ppm (v/v)

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VSS01390	18-04-1122-1-A	04/13/18 11:45	Air	GC 14	N/A	04/18/18 16:30	180418L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Methane	82	1.0	0.21	1.00	

VSS01392	18-04-1122-3-A	04/13/18 11:46	Air	GC 14	N/A	04/18/18 16:46	180418L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Methane	45	1.0	0.21	1.00	

Method Blank	099-07-024-1542	N/A	Air	GC 14	N/A	04/18/18 10:17	180418L02
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Methane	ND	1.0	0.21	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

AECOM 130 Robin Hill Road, Suite 100 Santa Barbara, CA 93117-3153 Project: Del Amo Superfund Site, Los Angeles / 60566446.2018.1.0601	Date Received: 04/13/18 Work Order: 18-04-1122 Preparation: N/A Method: EPA TO-3M Page 1 of 1
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
18-04-1056-4	Sample	Air	GC 13	N/A	04/13/18 10:56	180413D01
18-04-1056-4	Sample Duplicate	Air	GC 13	N/A	04/13/18 11:08	180413D01
<u>Parameter</u>	<u>Sample Conc.</u>		<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	15460		15350	1	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: ASTM D-1946

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 1 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-16-444-766	LCS	Air	GC 65	N/A	04/13/18 10:15	180413L01
099-16-444-766	LCSD	Air	GC 65	N/A	04/13/18 10:36	180413L01

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	15.01	14.98	100	15.08	100	80-120	1	0-30	
Carbon Monoxide	7.020	6.746	96	6.752	96	80-120	0	0-30	
Oxygen (+ Argon)	3.990	3.918	98	3.859	97	80-120	2	0-30	
Nitrogen	69.45	64.74	93	64.54	93	80-120	0	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 2 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-12-981-8459	LCS	Air	GC/MS OOO	N/A	04/14/18 11:51	180414L02				
099-12-981-8459	LCSD	Air	GC/MS OOO	N/A	04/14/18 12:42	180414L02				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	0.02500	0.02685	107	0.02890	116	50-150	33-167	7	0-35	
Benzene	0.02500	0.02532	101	0.02540	102	60-156	44-172	0	0-40	
Benzyl Chloride	0.02500	0.02713	109	0.02619	105	50-150	33-167	4	0-35	
Bromodichloromethane	0.02500	0.02553	102	0.02561	102	50-150	33-167	0	0-35	
Bromoform	0.02500	0.02502	100	0.02513	101	50-150	33-167	0	0-38	
Bromomethane	0.02500	0.02450	98	0.02623	105	50-150	33-167	7	0-35	
2-Butanone	0.02500	0.02728	109	0.02714	109	50-150	33-167	1	0-35	
Carbon Disulfide	0.02500	0.02694	108	0.02799	112	50-150	33-167	4	0-35	
Carbon Tetrachloride	0.02500	0.02513	101	0.02528	101	64-154	49-169	1	0-32	
Chlorobenzene	0.02500	0.02619	105	0.02628	105	50-150	33-167	0	0-35	
Chloroethane	0.02500	0.02625	105	0.02789	112	50-150	33-167	6	0-35	
Chloroform	0.02500	0.02512	100	0.02699	108	50-150	33-167	7	0-35	
Chloromethane	0.02500	0.02775	111	0.02946	118	50-150	33-167	6	0-35	
Dibromochloromethane	0.02500	0.02534	101	0.02554	102	50-150	33-167	1	0-35	
Dichlorodifluoromethane	0.02500	0.02966	119	0.03206	128	50-150	33-167	8	0-35	
Diisopropyl Ether (DIPE)	0.02500	0.02592	104	0.02871	115	60-140	47-153	10	0-30	
1,1-Dichloroethane	0.02500	0.02613	105	0.02632	105	50-150	33-167	1	0-35	
1,1-Dichloroethene	0.02500	0.02583	103	0.02744	110	50-150	33-167	6	0-35	
1,2-Dibromoethane	0.02500	0.02693	108	0.02700	108	54-144	39-159	0	0-36	
Dichlorotetrafluoroethane	0.02500	0.02559	102	0.02764	111	50-150	33-167	8	0-35	
1,2-Dichlorobenzene	0.02500	0.02492	100	0.02501	100	34-160	13-181	0	0-47	
1,2-Dichloroethane	0.02500	0.02606	104	0.02738	110	69-153	55-167	5	0-35	
1,2-Dichloropropane	0.02500	0.02629	105	0.02636	105	67-157	52-172	0	0-35	
1,3-Dichlorobenzene	0.02500	0.02480	99	0.02495	100	50-150	33-167	1	0-35	
1,4-Dichlorobenzene	0.02500	0.02413	97	0.02463	99	36-156	16-176	2	0-47	
1,4-Dioxane	0.02500	0.02673	107	0.02701	108	50-150	33-167	1	0-30	
c-1,3-Dichloropropene	0.02500	0.02772	111	0.02779	111	61-157	45-173	0	0-35	
c-1,2-Dichloroethene	0.02500	0.02654	106	0.02615	105	50-150	33-167	1	0-35	
t-1,2-Dichloroethene	0.02500	0.02590	104	0.02579	103	50-150	33-167	0	0-35	
t-1,3-Dichloropropene	0.02500	0.02793	112	0.02826	113	50-150	33-167	1	0-35	
Ethanol	0.1000	0.1005	101	0.1081	108	60-140	47-153	7	0-30	
Ethyl-t-Butyl Ether (ETBE)	0.02500	0.02469	99	0.02611	104	60-140	47-153	6	0-30	
Ethylbenzene	0.02500	0.02681	107	0.02663	107	52-154	35-171	1	0-38	
4-Ethyltoluene	0.02500	0.02730	109	0.02605	104	50-150	33-167	5	0-35	
Hexachloro-1,3-Butadiene	0.02500	0.02585	103	0.02600	104	50-150	33-167	1	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 3 of 6

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
2-Hexanone	0.02500	0.02860	114	0.02836	113	50-150	33-167	1	0-35	
Methyl-t-Butyl Ether (MTBE)	0.02500	0.02583	103	0.02653	106	50-150	33-167	3	0-35	
Methylene Chloride	0.02500	0.02484	99	0.02624	105	50-150	33-167	5	0-35	
4-Methyl-2-Pentanone	0.02500	0.02728	109	0.02719	109	50-150	33-167	0	0-35	
Naphthalene	0.02500	0.02645	106	0.02691	108	40-190	15-215	2	0-30	
o-Xylene	0.02500	0.02485	99	0.02504	100	52-148	36-164	1	0-38	
p/m-Xylene	0.05000	0.05154	103	0.05173	103	42-156	23-175	0	0-41	
Styrene	0.02500	0.02648	106	0.02612	104	50-150	33-167	1	0-35	
Tert-Amyl-Methyl Ether (TAME)	0.02500	0.02444	98	0.02434	97	60-140	47-153	0	0-30	
Tert-Butyl Alcohol (TBA)	0.05000	0.05132	103	0.05846	117	60-140	47-153	13	0-30	
Tetrachloroethene	0.02500	0.02540	102	0.02532	101	56-152	40-168	0	0-40	
Toluene	0.02500	0.02559	102	0.02540	102	56-146	41-161	1	0-43	
Trichloroethene	0.02500	0.02629	105	0.02633	105	63-159	47-175	0	0-34	
Trichlorofluoromethane	0.02500	0.02533	101	0.02684	107	50-150	33-167	6	0-35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02500	0.02666	107	0.02802	112	50-150	33-167	5	0-35	
1,1,1-Trichloroethane	0.02500	0.02574	103	0.02721	109	50-150	33-167	6	0-35	
1,1,2-Trichloroethane	0.02500	0.02676	107	0.02666	107	65-149	51-163	0	0-37	
1,3,5-Trimethylbenzene	0.02500	0.02531	101	0.02570	103	50-150	33-167	2	0-35	
1,1,2,2-Tetrachloroethane	0.02500	0.02594	104	0.02623	105	50-150	33-167	1	0-35	
1,2,4-Trimethylbenzene	0.02500	0.02563	103	0.02569	103	50-150	33-167	0	0-35	
1,2,4-Trichlorobenzene	0.02500	0.02769	111	0.02830	113	50-150	33-167	2	0-35	
Vinyl Acetate	0.02500	0.02664	107	0.02748	110	50-150	33-167	3	0-35	
Vinyl Chloride	0.02500	0.02610	104	0.02815	113	45-177	23-199	8	0-36	
1,1-Difluoroethane	0.02500	0.02524	101	0.02664	107	60-140	47-153	5	0-30	
Isopropanol	0.02500	0.02574	103	0.02779	111	50-150	33-167	8	0-30	

Total number of LCS compounds: 60

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

LCS/LCSD - Surrogate

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-15M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 4 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number	
099-12-981-8459	LCS	Air	GC/MS OOO	N/A	04/14/18 11:51	180414L02	
099-12-981-8459	LCSD	Air	GC/MS OOO	N/A	04/14/18 12:42	180414L02	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	Qualifiers
1,4-Bromofluorobenzene	0.02500	0.02497	100	0.02478	99	57-129	
1,2-Dichloroethane-d4	0.02500	0.02481	99	0.02597	104	47-137	
Toluene-d8	0.02500	0.02490	100	0.02494	100	78-156	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: EPA TO-3M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 5 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
098-01-005-8411	LCS	Air	GC 13	N/A	04/13/18 09:47	180413L01
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		200.0	196.7	98	80-120	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

AECOM
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117-3153

Date Received: 04/13/18
Work Order: 18-04-1122
Preparation: N/A
Method: SCAQMD 25.1M

Project: Del Amo Superfund Site, Los Angeles /
60566446.2018.1.0601

Page 6 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-07-024-1542	LCS	Air	GC 14	N/A	04/18/18 09:46	180418L02			
099-07-024-1542	LCSD	Air	GC 14	N/A	04/18/18 10:01	180418L02			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	101.0	90.97	90	91.21	90	80-120	0	0-20	

[Return to Contents](#)

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Sample Analysis Summary Report

Work Order: 18-04-1122

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	1145	GC 65	2
EPA TO-15M	N/A	748	GC/MS 000	2
EPA TO-15M	N/A	953	GC/MS 000	2
EPA TO-3M	N/A	1145	GC 13	2
SCAQMD 25.1M	N/A	1145	GC 14	2


Return to Contents

Glossary of Terms and Qualifiers

Work Order: 18-04-1122

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0CLIENT: AECOMDATE: 04/13/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): _____°C (w/ CF): _____°C; ☐ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☒ Air ☐ FilterChecked by: 676

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☐ Not Present ☒ N/AChecked by: 676Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/AChecked by: 676

SAMPLE CONDITION:

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH__9)

☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH__2) ☐ 250PB ☐ 250PB_n (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s (pH__2) ☐ 500PB

☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s (pH__2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH__12) ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____

Air: ☒ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄,Labeled/Checked by: 676s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, znna = Zn (CH₃CO₂)₂ + NaOHReviewed by: 1053

ATTACHMENT 5

Data Validation Memo

TO: Julie Doane-Allmon **FILE:** 60566446.2018.1.0601
FROM: Lily Bayati, Senior Project Chemist **SITE:** Del Amo - SVE Pilot Test
DATE: July 13, 2018
SUBJECT: Summary of Data Validation for Eurofins/Calscience Reports: 18-04-0188, 18-04-0574, 18-04-0819, 18-04-1056, 18-04-1122; and Vista Reports: 1800551, and 1800573

Introduction

This report summarizes the findings of the data validation of 54 vapor samples and one field blank. These samples were collected April 2-13, 2018 as part of the 2018 SVE Pilot Test Vapor Sampling Event at Del Amo Superfund Site. Vista Analytical Laboratory, in El Dorado Hills, California performed the CARB 428 and EPA TO-9A analyses. Eurofins/Calscience Laboratories in Garden Grove, California performed all other analyses. The samples are listed in Table 1 included at the end of this document. The data were reviewed in accordance with AECOM Standard Operating Procedures, applicable analytical methods, and the principles presented in *USEPA National Functional Guidelines for Superfund Organic Methods Data Review* (EPA, 2017), and *USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review* (EPA, 2016).

Overall Assessment

The data reported in this package, as qualified are considered to be usable for meeting project objectives. With the exception of the rejected data, all results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 95%. Additionally, because all samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered to be comparable.

Data Review Narratives

Forty-two vapor samples were collectively analyzed for volatile organic compounds (VOCs; EPA method TO-15), fixed gases (ASTM D-1946), TPH as gasoline (EPA method TO-3), and methane (SCAQMD 25.1). In addition, six vapor samples and one field blank were analyzed for polychlorinated dibenzo-p-dioxins and dibenzofurans (CARB method 428), and six vapor samples were analyzed for polychlorinated dibenzo-p-dioxins and dibenzofurans (EPA method TO-9A). The laboratory data were reviewed to evaluate compliance with these methods and the quality of the data reported (EPA Superfund Stage 2A validation). Full validation including recalculation (EPA Superfund Stage 4A validation) was performed on 10% of the Eurofins/ Calscience laboratory data. The following summarizes the results of this review.

The areas of review are listed below. A check mark (✓) indicates an area of review in which all data were acceptable. A crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ⊗ Holding Times and Preservation
- ✓ Calibrations (Full Validation)
- ✓ Internal Standards (Full Validation)
- ✓ GC/MS Instrument Performance Check Samples (Full Validation)
- ✓ Blanks
- ⊗ Labeled Standards (CARB 428, EPA TO-9A)
- ✓ System Monitoring Compounds (Surrogates)
- ✓ Laboratory Control Samples (LCSs)
- ✓ Laboratory Duplicates
- ✓ Target Analyte Identification and Quantitation (Full Validation)

1. Data Completeness

All analyses were performed as requested on the chain-of-custody records (COCs). The laboratory reported all requested analyses and the deliverable data reports were complete.

2. Holding Times and Preservation

All samples were collected and preserved appropriately. In addition, all analyses were performed within the method-specified holding times with the exceptions listed in the following table.

Method	Sample	Comment	Qualified Analytes	Qualifier
EPA TO-15	VSS01367	Due to laboratory oversight, sample was analyzed outside of the holding time.	All Analytes	J/UJ
EPA TO-9A	A-MT09-2 A-MT09-3	Samples received and extracted outside of the recommended holding time.		

3. Calibration (Full Validation)

3.1 Initial Calibration (IC)

Appropriate initial calibrations were performed for each analyte. Compliance requirements for all methods were met and did not require data qualification.

3.2 Initial Calibration Verification, Continuing Calibration Verification (ICV, CCV)

The acceptance criteria for all ICVs and CCVs were met or did not require qualification.

4. Internal Standards (Full Validation)

All internal standard retention times were within ± 30 seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ($>50\%$ and $<200\%$) of the associated continuing calibrations internal standard area counts.

5. GC/MS Instrument Performance Check Samples (Full Validation)

Compliance requirements for instrument performance check samples were met for EPA method TO-15.

6. Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed. Target analytes were either not detected in the associated method blanks or did not require data qualification. In addition, target analytes were not detected in the field blank.

7. Labeled Standards (CARB 428, EPA TO-9A)

All internal standard, pre-spike standard and surrogate standard recoveries for all samples were within the laboratory's acceptance ranges with the following exception. The extraction glassware for sample A-MTO9-5 was cracked during the extraction process and significant amount of the extract was lost. Consequently, the internal standard recoveries for sample A-

MT09-5 were lower than acceptance ranges and the pre-spiked standard recoveries were higher than acceptance ranges. Since the direction of bias cannot be determined, the results for this sample are suspect.

Method	Sample	Comment	Qualified Analytes	Qualifier
EPA TO-9A	A-MT09-5	Sample loss during Extraction	Detected Analytes	J-
			Non-detects	R

8. System Monitoring Compounds (Surrogates)
Appropriate numbers of surrogate compounds were spiked into each sample for EPA TO-15 analyses. All surrogate compound recoveries were within the laboratory's statistically determined acceptance ranges.
9. Laboratory Control Samples (LCSs)
LCSs were prepared and analyzed at the proper frequency. All LCS and LCS duplicate (LCSD) recoveries reported and relative percent differences (RPDs) between the results (for applicable analytical batches) were within the laboratory's statistically determined acceptance ranges. In addition, the recoveries for all ongoing precision and recovery (OPR) samples for CARB method 428 and EPA TO-9A were within laboratory's acceptance ranges.
10. Laboratory Duplicates
Acceptable analytical precision was demonstrated for all laboratory duplicate analyses.
11. Target Analyte Identification and Quantitation (Full Validation)
All analytes reported and the reporting limits obtained comply with project specifications. All dilutions were appropriate. In addition, this data review process included result recalculation and transcription error checking from the raw data for 10% of the data. All results checked were confirmed.

Table 1
Eurofins/ Calscience Laboratories

Sample	SDG	Sample Number	Date Sampled	Analysis Performed
VSS01361	18-04-0188	18-04-0188-1	4/3/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01362	18-04-0188	18-04-0188-2	4/3/18	EPA TO-15, TO-3
VSS01363	18-04-0188	18-04-0188-3	4/3/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01360	18-04-0188	18-04-0188-4	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01358	18-04-0188	18-04-0188-5	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01359	18-04-0188	18-04-0188-6	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01357	18-04-0188	18-04-0188-7	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01356	18-04-0188	18-04-0188-8	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01355	18-04-0188	18-04-0188-9	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01354	18-04-0188	18-04-0188-10	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01353	18-04-0188	18-04-0188-11	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01352	18-04-0188	18-04-0188-12	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01351	18-04-0188	18-04-0188-13	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01350	18-04-0188	18-04-0188-14	4/2/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01366	18-04-0574	18-04-0574-1	4/5/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01365	18-04-0574	18-04-0574-2	4/5/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01367	18-04-0574	18-04-0574-3	4/5/18	EPA TO-15, TO-3
VSS01368	18-04-0574	18-04-0574-4	4/6/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01369	18-04-0574	18-04-0574-5	4/6/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01370	18-04-0574	18-04-0574-6	4/6/18	EPA TO-15, TO-3
VSS01371	18-04-0819	18-04-0819-1	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01372	18-04-0819	18-04-0819-2	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01373	18-04-0819	18-04-0819-3	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01374	18-04-0819	18-04-0819-4	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01375	18-04-0819	18-04-0819-5	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01376	18-04-0819	18-04-0819-6	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01377	18-04-0819	18-04-0819-7	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01378	18-04-0819	18-04-0819-8	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01379	18-04-0819	18-04-0819-9	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01380	18-04-0819	18-04-0819-10	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01381	18-04-0819	18-04-0819-11	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01382	18-04-0819	18-04-0819-12	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01383	18-04-0819	18-04-0819-13	4/9/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01384	18-04-1056	18-04-1056-1	4/11/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01385	18-04-1056	18-04-1056-2	4/11/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01386	18-04-1056	18-04-1056-3	4/11/18	EPA TO-15, TO-3
VSS01387	18-04-1056	18-04-1056-4	4/12/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01388	18-04-1056	18-04-1056-5	4/12/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01389	18-04-1056	18-04-1056-6	4/12/18	EPA TO-15, TO-3
VSS01390	18-04-1122	18-04-1122-1	4/13/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1
VSS01391	18-04-1122	18-04-1122-2	4/13/18	EPA TO-15, TO-3
VSS01392	18-04-1122	18-04-1122-3	4/13/18	EPA TO-15, TO-3; ASTM D-1946; SCAQMD 25.1

Table 1
Vista Analytical Laboratory

Sample	SDG	Sample Number	Date Sampled	Analysis Performed
S-1A-M428-1	1800551	1800551-01	4/4/18	CARB Method 428
S-1A-M428-2	1800551	1800551-02	4/5/18	CARB Method 428
S-1A-M428-3	1800551	1800551-03	4/6/18	CARB Method 428
M428-FB (Field Blank)	1800551	1800551-04	4/6/18	CARB Method 428
S-1B-M428-1	1800551	1800551-05	4/11/18	CARB Method 428
S-1B-M428-2	1800551	1800551-06	4/12/18	CARB Method 428
S-1B-M428-3	1800551	1800551-07	4/13/18	CARB Method 428
M428-RB (Reagent Blank)	1800551	1800551-08	4/13/18	Not Analyzed
A-MTO9-2	1800573	1800573-01	4/5/18	EPA TO-9A
A-MTO9-3	1800573	1800573-02	4/5/18	EPA TO-9A
A-MTO9-4	1800573	1800573-03	4/10/18	EPA TO-9A
A-MTO9-5	1800573	1800573-04	4/11/18	EPA TO-9A
A-MTO9-6	1800573	1800573-06	4/12/18	EPA TO-9A
A-MTO9-7	1800573	1800573-07	4/13/18	EPA TO-9A

SDG: Sample Delivery Group
EPA TO-15: Volatile Organic Compounds (VOCs)
EPA TO-3: TPH as Gasoline
EPA TO-9A: Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans in Ambient Air
ASTM D-1946: Fixed Gases (Carbon Dioxide, Carbon Monoxide, Nitrogen, Oxygen+Argon)
SCAQMD 25.1: Methane
CARB Method 428: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

ATTACHMENT A
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by AECOM Data Review Team

DATA QUALIFIER DEFINITIONS FOR ORGANIC ANALYSES

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

AECOM DATA QUALIFIER DEFINITIONS — REASON CODE DEFINITIONS

- a Analytical sequence deficiency or omission.
- b Gross compound breakdown (4,4'-DDT/Endrin).
- c Calibration failure; poor or unstable response.
- d Laboratory duplicate imprecision.
- e Laboratory duplicate control sample imprecision.
- f Field duplicate imprecision.
- g Poor chromatography.
- h Holding time violation.
- i Internal standard failure.
- j Poor mass spectrographic performance.
- k Serial dilution imprecision.
- l Laboratory control sample recovery failure.
- m Matrix spike/matrix spike duplicate recovery failure.
- n Interference check sample recovery failure.
- o Calibration blank contamination (metals/inorganics only).
- p Preparation blank contamination (metals/inorganics only).
- q Quantitation outside linear range.
- r Linearity failure in initial calibration.
- s Surrogate spike recovery failure (GC organics and GC/MS organics only).
- t Instrument tuning failure.
- u No valid confirmation column (GC Organics only).
- v Value is estimated below the MDA (Rads only).
- w Retention time (RT) outside of RT window.
- x Field blank contamination.
- y Trip blank contamination.
- z Method blank contamination.

INTERPRETATION KEY

The following example shows how an analytical result which includes qualifiers assigned by both the AECOM data review team and the analytical laboratory could be displayed in the data tables:

<5.20 Uz | JB

The qualifier assigned by the AECOM data review team precedes the "|"; the qualifier assigned by the laboratory follows it. In this example, the result is qualified as a non-detection data to the bias introduced by contamination of the associated method blank. Presence of the analyte in the method blank is indicated by the laboratory qualifier (B). The qualifier assigned by the AECOM data review team (Uz) indicates that the analyte concentration is considered to be below the adjusted detection limit (quantitation limit) based on the level of contamination in the method blank.

ATTACHMENT 6
Mass Balance Calculations for SVE-1B Wellhead Flowrate

ATTACHMENT 6
MASS BALANCE CALCULATIONS FOR SVE-1B WELLHEAD FLOW RATE – Deep Zone
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Mass balance to calculate flow at SVE-1B wellhead (Fw)

Fs = Flow at system

Fw = Flow at wellhead

Fda = Flow - dilution air

C = concentration

$$F_s = F_w + F_{da}$$

$$F_s \cdot C_{i,s} = F_w \cdot C_{i,w} + F_{da} \cdot C_{i,da}$$

$C_{i,da} = 0$ (assuming no benzene or ethylbenzene in dilution air)

$$F_w = F_s \cdot (C_{i,s} / C_{i,w})$$

Date	Fs (scfm)	component, i = benzene			component, i = ethylbenzene			Average estimated well head flow rate based on B and EB (scfm)
		Ci,s (ppmv)	Ci,w (ppmv)	Estimated well head flow rate Fw (scfm) based on benzene	Ci,s (ppmv)	Ci,w (ppmv)	Estimated well head flow rate Fw (scfm) based on ethylbenzene	
4/11/2018	116	3,900	7,500	60.3	3,200	4,800	77.3	68.8
4/12/2018	116	4,100	7,200	66.1	3,400	5,900	66.8	66.5
4/13/2018	117	2,600	4,800	63.4	1,300	1,900	80.1	71.7

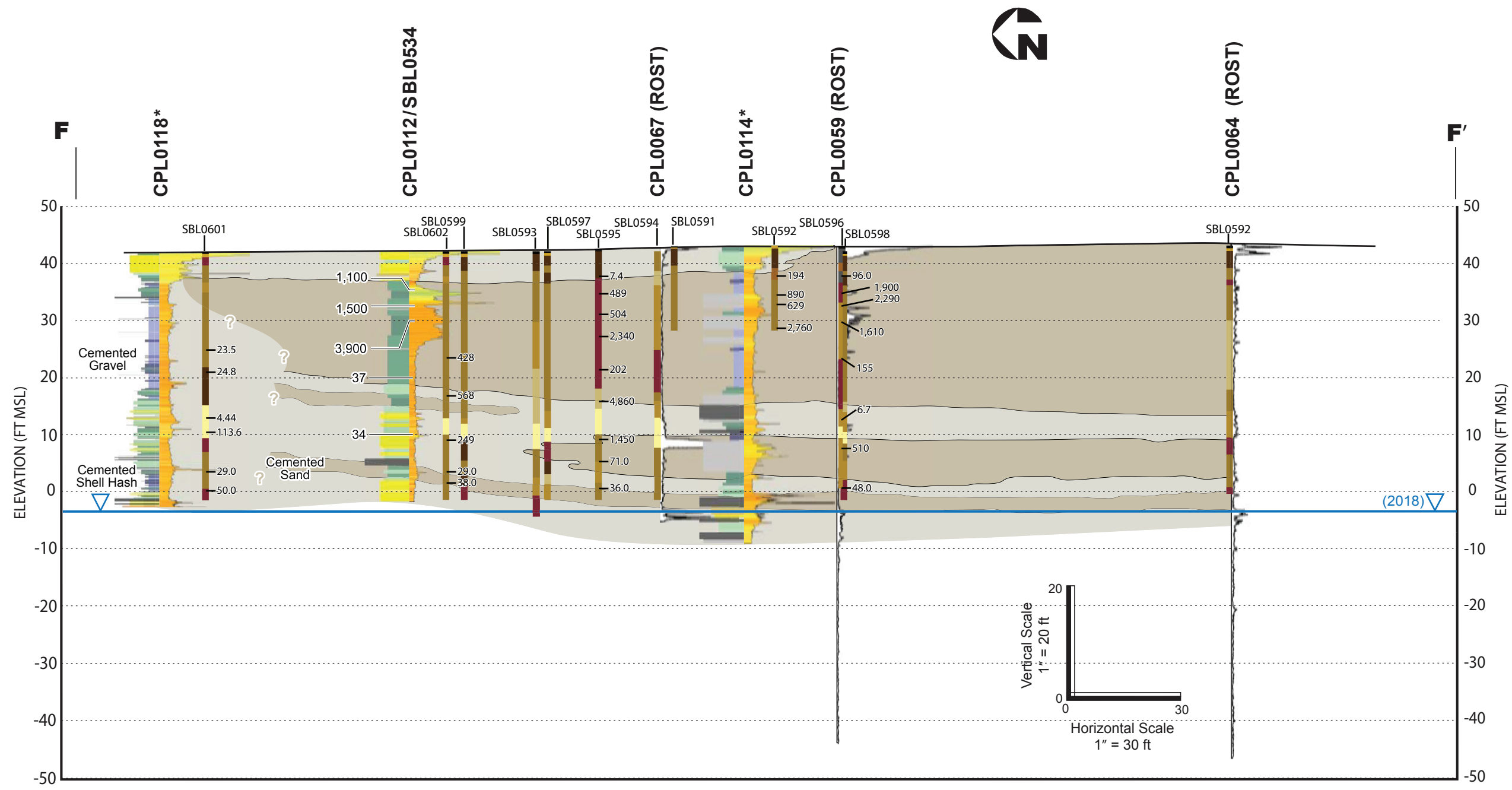
Average of all estimated values for Fw =	69.0	scfm
Average of VelociCalc values for Fw =	123.0	scfm
Velocicalc overestimated by ~ 75 percent		

Notes:

ppmv = parts per million by volume

scfm = standard cubic feet per minute

ATTACHMENT 7
SA-6 Cross Section (2018) and Pre-design Investigation Boring Logs



Legend

CPT log showing interpreted soil types

UVOST log (0-50%) with corresponding C₄-C₁₂ TPH concentrations in soil (mg/kg) from 2011 NAPL Characterization Report

ROST log from 1998 Dames & Moore NAPL screening investigation

Water table

Sand to Silty Sand

Sandy Silt to Silt

Silty Clay to Clay

Cemented

*

CPT logs suspect and not used for soil type interpretation at CPL0114

Lithologic Boring Total VOCS (mg/kg)

235

USCS Soil Classifications

Asphalt	SM
GW	SM-SC
SW	ML
SP	CL
SP-SM	CH

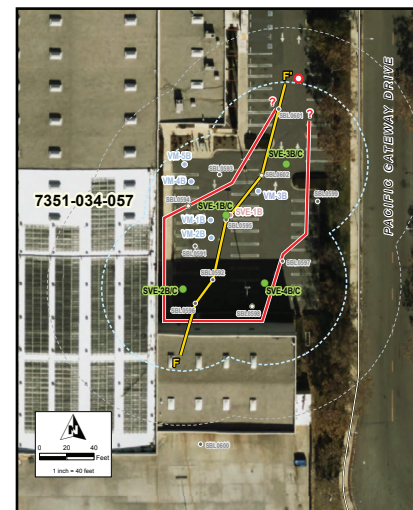
NOTES

NAPL - Non-Aqueous Phase Liquid
VOC - Volatile Organic Compound
CPT - Cone Penetration Test
mg/kg - milligrams per kilogram

FT MSL - Feet above Mean Sea Level
USCS - Unified Soil Classification System
UVOST - Ultra Violet Optical Screening Tool
TPH - Total Petroleum Hydrocarbons

Lithologic Borings within 25 feet of F-F' have been projected onto the section.

Section Location Map



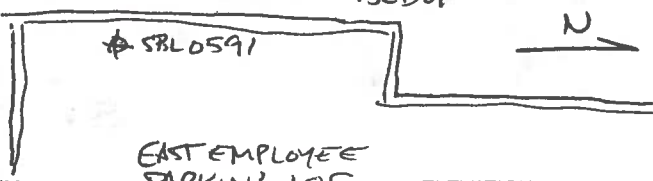
SVE Pilot Test Report

**CROSS SECTION F-F'
Source Area 6**

Soil and NAPL Operable Unit - OU1
Del Amo Superfund Site

AECOM

By P. SHOREDrilling Contractor GREGG DRILLINGDate 4/26/17 Checked by _____**BORING LOG**

LOCATION OF BORING <u>COKE BLDG</u>  EAST EMPLOYEE PARKING LOT ELEVATION _____								JOB NUMBER <u>60487624.2017.1.3</u>		LOCATION APN: <u>7351-034-057</u>	
DRILLING METHOD: <u>HAND AUGER 0-8' / 33'</u> <u>Direct push Geoprobe Limited Access Rig</u>								BORING NUMBER <u>SBL0591</u>			
SAMPLING METHOD: <u>TERROCORE KITS</u>								SHEET 1 of 2			
SURFACE CONDITIONS: <u>ASPHALT</u>								DRILLING START TIME <u>1100</u> FINISH TIME <u>1500</u> DATE <u>4/26/17</u> DATE <u>4/27/17</u>			

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SOIL DESCRIPTION
							0		ASPHALT
							1	CL	COMPACTED GRAVEL BASE ROCK V. DK BROWN (10YR 2/2) SANDY, SILTY CLAY w/ GRAVEL, MOIST, STIFF, MODERATE CHEMICAL ODOR, LOW-MED PLASTICITY (15, 20, 20, 45)
					22.5		2		
					8.7		3		
					17.6		4	SM	DK GREENISH GRAY (GREY) (10YR 4/10Y) SILTY V. FINE SAND w/ GRAVEL + CLAY, MOIST, DENSE, MODERATE CHEMICAL ODOR + STAINING (15, 50, 25, 10)
HA	-	1115	4.5- 5.0	-	8.6	55502424	5		
					45.4		6		6.0' - BECOMES DK. YELLOWISH BROWN (10YR 4/4), DECREASED GRAVEL + CLAY (10, 50, 35, 5)
					46.0		7	SM	DK YELLOWISH BROWN (10YR 4/4) SILTY FINE SAND w/ TRACE FINE GRAVEL, MOIST, DENSE, MODERATE CHEMICAL ODOR (5, 60, 35, 0)
HA	-	1130	7.5- 8.0	-	27.2	55502425	8		CLEARED TO 8.0' BGS BY HAND AUGER ON 4/26/17 Commenced direct push geoprobe drilling at 1445 on 4/27/17 No gravels observed (0, 60, 40, 0)
					100.5		9		
							10		

By C. Eckert
Date 4/27/17 Checked by _____

Drilling Contractor Grass Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER <u>60487624</u>	LOCATION		
DATUM _____ ELEVATION _____										DRILLING METHOD: _____	BORING NUMBER <u>5BL0591</u>		
										SAMPLING METHOD: _____		SHEET <u>2</u> of <u>2</u>	
										SURFACE CONDITIONS: _____		START TIME <u>1500</u>	FINISH TIME
												DATE <u>4/27/17</u>	DATE
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH					
							10	SM					
		1500	10.5		148.5	55502475							
							11		@ 11.0' bgs becomes yellowish brown (10YR 5/6)				
					134.2		12						
	3 3				210.3		13						
		1510	14.0		330.9	55502476	14						
					183.0		15						
									Boring reached T.B. of 15.0' bgs at 1500 on 4/27/17. Borehole backfilled with 0.5 50lb bag of hydrated Enviroplug medium bentonite chips to 0.5' bgs and completed with cold patch asphalt to match surface grade.				
							6						
							7						
							8						
							9						
							0						

Drilling Contractor GREG DRILLING

Date 4/26/17 Checked by _____

BORING LOG

LOCATION OF BORING										JOB NUMBER		LOCATION	
<div> <div>COKE BLDG</div> <div> </div> <div> # SBL0592 EAST EMPLOYEE PARKING LOT </div> </div>										60487624.2017.13		APN: 7351-034-057	
DRILLING METHOD: HAND AUGER: 0-8' by Direct pull Geoprobe Limited Access Rig										BORING NUMBER			
										SBL0592			
										SHEET			
										1 of 2			
SAMPLING METHOD: TERRACORE KTS										DRILLING			
SURFACE CONDITIONS:										START TIME	FINISH TIME		
ASPHALT										0920	0820		
										DATE	DATE		
										4/26/17	4/28/17		
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH			
									0	ASPHALT			
									0.5	GW	COMPACTED GRAVEL BASE ROCK		
						212.7			1	CL	V. DK BROWN (10yr 2 1/2) SANDY, SILTY CLAY w/ GRAVEL		
						0.5			1.5		MOIST, STIFF, STRONG CHEMICAL ODOR, NON-ACTIVE DEBRIS - ARTIFICIAL FILL (15, 20, 20, 45)		
									2		0.15' - WEAK CHEMICAL ODOR		
						286			3				
									4				
HA	-	0955	4.5-5.0	-	165.8	685.0	SSS02416		4.5	SM-SC	V. DK BROWN (10yr 2 1/2) TO DK YELLOWISH BROWN (10yr 4/4) SILTY, CLAYEY FINE SAND w/ TRACE FINE GRAVEL, MOIST, DENSE, STRONG CHEMICAL ODOR (S, 45, 25, 25)		
									5				
									6	SM	DK YELLOWISH BROWN (10yr 4/6) SILTY FINE SAND w/ TRACE FINE GRAVEL, MOIST, DENSE, STRONG CHEMICAL ODOR (S, 60, 35, 0)		
									7				
HA	-	1015	7.5-8.0	-	440.4	6,114	SSS02423*		8				
	4	4					* COLLECTED SPLIT SAMPLE FOR CBRI/EPA		8	SM	CLEANED TO 8.0' BGES BY HAND AUGER ON 4/26/17		
									9				
			0810	9.5			SSS02477		10				

By C. EckertDate 4/28/17 Checked by _____Drilling Contractor Gress Drilling**BORING LOG**

LOCATION OF BORING _____

JOB NUMBER

60487624

LOCATION _____

DRILLING METHOD: _____

BORING NUMBER

51320592

SHEET

2 of 2

SAMPLING METHOD: _____

DRILLING

START TIME FINISH TIME

0820

DATE

DATE

4/28/17

DATUM _____

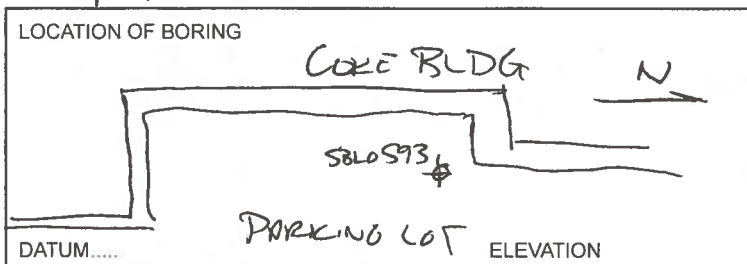
ELEVATION _____

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____
							1.0	SM	^{OB} Dark yellowish brown (10PR 5/6) silty sand with trace gravel, moist, dense, odor (5, 60, 35, 0)
					1931		1.1		
					3092		1.2		1/4-3/8" gravel observed at 11.0' bgs
	3/3						1.3		
							1.4		
		0820	15.0		422455502478		1.5		Strong chemical odor @ 14.5' bgs
							6		Drilling operations ceased at 0820 on 4/28/17. T.D. 15.0' bgs
							7		The borehole was backfilled with 0.5 50-15 bgs of hydrated Envirolog med. bentonite chips to 0.5' bgs. Surface completed with cold-patch asphalt to match existing grade and conditions
							8		
							9		
							0		

By T. SHORE, C. Eckert
Date 4/25/17 Checked by _____

Drilling Contractor GREEN DRILLING

BORING LOG

LOCATION OF BORING								JOB NUMBER	LOCATION	
								60487624.2017.13	APN: 7351-034-057	
								DRILLING METHOD: <u>HAND AUGER: 0-8' bgs</u>	BORING NUMBER	
								<u>Direct pull geopraxis Limited Access</u>	<u>SBLO593</u>	
								<u>Pig: 8-47' bgs</u>	SHEET	
								SAMPLING METHOD: <u>TERRACORE KITS</u>	<u>1 of 5</u>	
								DRILLING		
								SURFACE CONDITIONS: _____	START TIME	FINISH TIME
								<u>ASPHALT</u>	<u>1000</u>	
									DATE	DATE
									<u>4/25/17</u>	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH		
							0	ASPHALT		
					7.8		1	CL	V. DK BROWN (1042 2/2) CLAY W/ SAND + GRAVEL, MOIST, STIFF, NON-NATIVE DEBRIS, MEDIUM PLASTICITY. ARTIFICIAL FILL (15, 20, 0, 65)	
					3.4		2			
					7.9		3			
							4	SM	DK GREENISH GRAY (614 1 4/104) SILTY, CLAYEY ^{RS} FINE SAND W/ CLAY + TRACE FINE GRAVEL, MOIST TO WET, DENSE, WEAK CHEMICAL DEGRADATION (5, 55, 25, 15)	
HA	-	1005	4.5-5.0	-	6.5	SSS02378	5			
					3.5		6	SM	GREENISH GRAY (614 1 5/104) SILTY FINE SAND W/ TRACE FINE GRAVEL, MOIST, DENSE, WEAK CHEMICAL DEGRADATION + STAINING (5, 60, 35, 0)	
							7		② 7.0' - BECOMES BROWN (1042 5/3)	
HA	-	1020	7.5-8.0	-	5.2	SSS02396	8		CLEARED TO 8.0' BGS BY HAND AUGER ON 4/25/17	
	4/3.7				5.0		9			
							10			

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER 60487624	LOCATION
DATUM..... ELEVATION								DRILLING METHOD:	BORING NUMBER SBL0593
								SAMPLING METHOD:	SHEET 2 of 5
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:
					SAMPLE				
									DATE
							10		
							11		
		1440				SSJ02390			
			11.7						
	4/4						12		No recovery 11.7-12.0' bgs
							13	SP	Olive (5Y 4/3) poorly graded fine sand with trace silt, moist, dense, no odor or staining
							14		(0, 95, 5, 0)
							15		at 14' bgs becomes dark greenish gray (GLEY 1.5GY 4/1)
		1455	15.0			SSJ02391			
							16		
	4/4				0.7				
					0.8		17		
							18		
					4.8		19		
							20		

By C. EckertDate 4/25/17 Checked by _____Drilling Contractor Gregg Drilling**BORING LOG**

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD:

BORING NUMBER

SBL0593

SHEET

3 of 5

SAMPLING METHOD:

DRILLING

SURFACE CONDITIONS:

START TIME FINISH TIME

DATE

DATE

DATUM.....

ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	
	4 4				91.3		20		
							21	SP-SM	Yellowish brown (10YR 5/4) Poorly graded sand with silt, moist, dense, no odor, some staining
		1505	22.0			55502392	22		(0, 90, 10, 0)
					125.1				
							23		
	4 4				65.3		24		
					89.1		25		
							26		
					193.7		27		
							28		
	4 4				64.8		29		
		1530	29.5		67.9	55502407	30		

By C. Eckert

Drilling Contractor

Gress DrillingDate 4/25/17 Checked by _____**BORING LOG**

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD:

BORING NUMBER

SL3L0593

SHEET

4 of 5

SAMPLING METHOD:

DATUM.....

ELEVATION

SURFACE CONDITIONS:

DRILLING

START TIME FINISH TIME

DATE

DATE

SAMPLER
TYPEFEET
DRIVEN
FEET
RECOVERED

TIME

SAMPLE
DEPTHBLOWS/FT.
SAMPLERPID
SAMPLESAMPLE
NUMBERDEPTH
(feet)

SOIL GRAPH

								30		
					9.2			31	SW	Light yellowish brown (2.5Y 6/3) well graded sand, dry, moderate density, no odor or staining (0,100,0,0)
	4							32		
	4				3.1			33		
								34		
					44.1			35		
	4	1540	36.0		165.8	55502408		36	SM	Light olive brown (2.5Y 5/3) silty very fine sand, moist, dense, slight chemical odor (0,60,40,0)
	4							37		
					122.0			38		Increasing fines (0,50,50,0)
		1550	39.0		162.0	55502409		39		
								40		

By C. EckertDate 4/25/17 Checked by _____Drilling Contractor Grass Killing**BORING LOG**

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD:

BORING NUMBER

SBLO593

SHEET

5 of 5

SAMPLING METHOD:

DRILLING

START TIME FINISH TIME

1630

DATE

DATE

4/25/17

DATUM

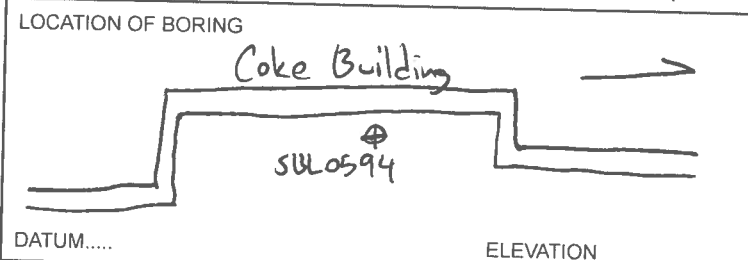
ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:
							40	SP	Yellowish brown (10YR 5/4) Poorly sorted fine sand, moist, dense, moderate chemical odor (0, 100, 0, 0)
		1600	42.0		206	55502393	42		
					136.7		43		
		1615	44.0		212.3	55502394	44	ML	Brown (10YR 4/3) mottled color with Gray (10YR 5/1) silt with sand, moist, dense, moderate chemical odor (0, 25, 75, 0)
					163.4		46		
							47		Shell hash approximately 50% highly broken shell pieces ~0.25" in size
							48		Boring terminated at 1630 T.D: 47.0' bgs
							49		Borehole backfilled with 2 50-lb bags of Enviroplug medium bentonite chips hydrated and completed with cold patch asphalt to 0.5' bgs
							50		

By C. Eckert
 Date 4/24/17 Checked by _____

Drilling Contractor Greys Drilling
and Testing

BORING LOG



JOB NUMBER 60487624	LOCATION 19875 Pacific Gateway, Los Angeles, CA
DRILLING METHOD: Hand auger: 0-8ft Airknift: 0-8' bgs, 1" diameter Direct push geoprobe Limited Access Rig	BORING NUMBER SBL0594
SAMPLING METHOD: Terra Core Kits Macrocure liners	SHEET 1 of 5
SURFACE CONDITIONS: Asphalt	
START TIME 1000	FINISH TIME 1530
DATE 4/24/17	DATE 4/26/17

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	
			1000				0	SM	Dark olive gray, (5Y 3/2) silty sand SM, dense, dry, no staining or odor (0, 80, 20, 0)
					29.0		1		
					61.0		2		
					492.0		3		
			1040 4.5-5.0			55502373	4	SP-SM	PID @ 3.5': 385 ppm Light olive gray (5Y 5/2) Poorly graded sand with silt SP-SM, dense, dry, hydratable odor (0, 90, 10, 0) Brown (7.5YR 4/3)
					579.0		5		
					3176		6		
					5746		7	SP	Brownish Yellow (10YR 6/6) Poorly graded fine sand with trace silt, loose, dry, strong odor (0, 95, 5, 0)
			1100 7.5-8.0		4862	55502369	8		Cleared to 8.0' bgs on 4/24/17 No recovery 8.0-10.5' bgs
	4 1.5						9		
							10		

24
25
26
T:\Addl\Standard Stuff\BoringLog.htm

By C. EckertDate 4/26/17 Checked by _____

Drilling Contractor

Gregg Drilling

BORING LOG

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD: _____

BORING NUMBER

58L0594

SHEET

2 of 5

SAMPLING METHOD: _____

DRILLING

START TIME FINISH TIME

SURFACE CONDITIONS: _____

DATE

DATE

DATUM

ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	
					1449		1.0		
							1.1	SP	
					1718		1.2		
4/3		1300	12.0-13.0			55502434			Physical Core taken from 12.0-13.0' bgs
		1315	13.0	2742		55502437	1.3		
		1310	14.0			55502436			
					3364		1.4		Physical Core taken from 12.0-13.0' bgs ^{CRE} 14.0-15.0' bgs
		1305	14.0-15.0			55502435	1.5		
							1.6		Increasing finer
4/4							1.7		Grades to:
		1340	17.0	2685		55502438	1.8	ML	Olive brown (2.5 P 4/4) sandy silt, dense, moist, odor
					1460		1.9		(0, 30, 70, 0)
					1584		2.0		

By C. Eckert
 Date 4/26/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM.....								DRILLING METHOD:		BORING NUMBER <u>SLZ 0594</u>		
ELEVATION								SAMPLING METHOD:		SHEET <u>3</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		DRILLING	
											START TIME	FINISH TIME
										DATE	DATE	
							20		Increasing fines (0, 20, 80, 0)			
							21					
			1400 21.3-22.6		755.1	55502440	22		1/4"-1/2" diameter rounded gravels 21.3-22.6' physical core taken			
					1875		23					
			1405 24.0'		2616	55502441	24					
			4 1405				25					
			1425 25.0		3688	55502442	26	SM	Grades to: Light olive brown (2.5Y 5/4) silty fine sand, moist, dense, odor (0, 70, 30, 0)			
					2757		27					
					2848		28	SP	Grades to: Olive (5Y 5/3) very fine sand with trace silt, moist, medium dense, odor (0, 95, 5, 0) poorly graded			
					8063		29					
			1435 29.0-30.0			55502443	30	SW	Physical core taken from 29.0-30.0' by Light gray (2.5Y 7/2) well graded very fine to medium sand, dry, loose, odor (0, 100, 0, 0)			
					1162							

By C. Eckert
 Date 4/26/17 Checked by _____

Drilling Contractor Grass Drilling

BORING LOG

LOCATION OF BORING		JOB NUMBER <u>60487624</u>	LOCATION
DATUM		DRILLING METHOD: _____	BORING NUMBER <u>SB20594</u>
ELEVATION		SAMPLING METHOD: _____	SHEET <u>4</u> of <u>5</u>
		SURFACE CONDITIONS: _____	DRILLING START TIME FINISH TIME
			DATE DATE

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	
							30		No recovery 30.0-32.0' bgs
							31		
							32	SW	
	4/4						33		
		1440	33.0		2997	55502444	34		
					1581		35	SM	Light, olive brown (2.5Y 5/3) silty very fine SAND, moist, dense, odor (0, 70, 30, 0)
	4/4				1023		36		
		1520			4552	55502446	37		
		1500	38.0- 39.0			55502445	38		Physical core taken from 38.0-39.0' bgs
					4466		39		
					2243		40		

By C. Eckert
Date 4/26/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD: _____

BORING NUMBER

SBL0594

SHEET

5 of 5

SAMPLING METHOD: _____

DRILLING

SURFACE CONDITIONS: _____

START TIME FINISH TIME

1530

DATE

DATE

4/26/17

DATUM

ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH
	<u>4</u> <u>0</u>						<u>40</u>	
							<u>41</u>	
							<u>42</u>	
							<u>43</u>	
							<u>44</u>	
							<u>5</u>	
							<u>6</u>	
							<u>7</u>	
							<u>8</u>	
							<u>9</u>	
							<u>0</u>	

No recovery from 40.0-44.0' bgs

Drilling operations ceased at 1530, 4/26/17
T.D. 44.0' bgs
The borehole was back filled with 2 50-lb
bags of hydrated Enviropack medium
bentonite chips to 0.5' bgs and completed
to match surface grade with cold-patch
asphalt.

By R. S. HORE, C. EckertDrilling Contractor Grebb DrillingDate 4/25/17 Checked by _____**BORING LOG**

LOCATION OF BORING										JOB NUMBER		LOCATION	
										60487624.2017.13		APN: 7351-034-057	
DRILLING METHOD: <u>HAND AUGER 0-8' & Direct Push Geoprobe Limited Access Rig</u>										BORING NUMBER		SHEET	
SAMPLING METHOD: <u>TERRACORE KITS</u>										SBLO595		1 of 5	
DATUM.....										SURFACE CONDITIONS:		DRILLING	
ELEVATION										ASPHALT		START TIME	
												0800	
												DATE	
												4/25/17	
SAMPLER TYPE	FEET DRIVEN	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH					
							0	ASPHALT					
					0.9		1	V. DK BROWN (10YR 2/2) FAT CLAY w/ SAND + GRAVEL MOIST, STIFF, NON-MATIVE DEBRIS - 'ARTIFICIAL FILL', HIGH PLASTICITY (20, 20, 4, 60)					
					169.4		2	(P) 2.5' - BECOMES TX GREENISH GRAY (5Y 1/4/10Y), MODERATE CHEMICAL ODOOR + STAINING					
					251.8		4	V. TX BROWN (10YR 2/2) SANDY LEAN CLAY w/ GRAVEL, MOIST, STIFF, LOW PLASTICITY, MODERATE CHEMICAL ODOOR (15, 20, 20, 45)					
HA	-	0845	4.5-5.0	-	32.5	55502376	5						
					43.9		6	YELLOWISH BROWN (10YR 5/6) FINE SANDY SILT w/ TRACE FINE GRAVEL, MOIST, STIFF, WEAK CHEMICAL ODOOR (5, 30, 65, 6)					
					1541		7						
					1,001	55502377	8	CLEARED TO 8.0' BGS ON 4/25/17 BY HAND AUGER Direct push drilling & sample commenced at 0820 4/26/17					
					195		9						
							10						

By C. Eckert
Date 4/26/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER <u>60487624</u>		LOCATION	
DATUM..... ELEVATION										DRILLING METHOD: _____		BORING NUMBER <u>SBL0595</u>	
										SAMPLING METHOD: _____		SHEET <u>2</u> of <u>5</u>	
										SURFACE CONDITIONS: _____		DRILLING	
										START TIME		FINISH TIME	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	DATE				
							10	ML	no trace gravel noted (0,30,70,0)				
		0846	11.0		1520	55502410	11		Strong Chemical Odor				
					785		12						
	4/4												
		0900	13.0		4182	55502411	13		Strong Chemical odor				
							14						
					2542		15						
							16						
	4/4												
					1594		17		moderate chemical odor				
							18						
					2737		19						
							20						

By C. Eckert
 Date 4/26/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION			
DATUM.....								ELEVATION		DRILLING METHOD: _____		BORING NUMBER <u>SBL0595</u>	
										SAMPLING METHOD: _____		SHEET <u>3</u> of <u>5</u>	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING		
											START TIME	FINISH TIME	
										DATE	DATE		
							20	ML					
							21						
							22						
							23	ML					
							24		Yellowish Brown (10YR 5/4) Fine sandy silt, moist, stiff, moderate chemical odor (0, 40, 60, 0)				
							25	SP-SM	Yellowish Brown (10YR 5/6) Poorly graded fine sand with silt, moist, dense, moderate chemical odor (0, 90, 10, 0)				
							26						
							27						
							28						
							29	SW	Light yellowish brown (10YR 6/4) Well graded fine to medium sand, moist loose, odor (0, 100, 0, 0)				
							30						

By C. Eckert
 Date 4/26/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM..... ELEVATION								DRILLING METHOD:		BORING NUMBER <u>5320595</u>		
								SAMPLING METHOD:		SHEET <u>4</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		DRILLING	
									START TIME	FINISH TIME	DATE	DATE
							30		No recovery 30-32' bgs			
							31					
							32	SW				
	4	3	620	33.0 33.2	1459	55502414	33	SM	Light olive brown (2.5Y 5/3) silty fine sand, moist, dense, odor (0, 60, 40, 0)			
					1378		34					
							35		No recovery 35-36.0' bgs			
							36					
	4	3			733	55502415	37					
			1035	37.0			38	SP	Olive (5Y 5/3) Poorly graded very fine sand with trace gravels 1/4-1/2" diameter, moist, dense, odor, rounded gravel (5, 95, 0, 0)			
					259		39					
					79.9		40					

By C. EckertDrilling Contractor Gross DrillingDate 4/26/17 Checked by _____**BORING LOG**

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD: _____

BORING NUMBER

SBLO595

SHEET

5 of 5

SAMPLING METHOD: _____

DRILLING

SURFACE CONDITIONS: _____

START TIME

1055

DATE

DATE
4/26/17

DATUM.....

ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	
	<u>4</u> <u>3</u>				<u>87.4</u>		<u>40</u>	<u>SP</u>	<u>Yellowish red (5YR 5/6) medium dense</u> <u>no gravels (0, 100, 0, 0)</u>
							<u>41</u>		
		<u>1050</u>	<u>42.0</u>		<u>291.3</u>	<u>5550243</u> <u>5550431</u>	<u>42</u>	<u>SM</u>	<u>Grayish brown (10YR 5/2) silty fine</u> <u>sand, moist, dense, odor, reddish brown</u> <u>staining (0, 75, 25, 0)</u>
					<u>11.0</u>		<u>43</u>		<u>Increasing fines (0, 55, 45, 0)</u> <u>No recovery 43-44.0' bgs</u>
							<u>44</u>		<u>Boring terminated at 1055 on 4/26/17</u> <u>T.D: 44.0' bgs and was backfilled with</u> <u>2 50-lb bags of hydrated Enviropug medium</u> <u>bentonite chips to 0.5' bgs. Compacted cold</u> <u>patch asphalt to match surface grade.</u>
							<u>5</u>		
							<u>6</u>		
							<u>7</u>		
							<u>8</u>		
							<u>9</u>		
							<u>0</u>		

By R. SHORE, C. EckertDrilling Contractor GRESS DRILLINGDate 4/24/17 Checked by _____**BORING LOG**

LOCATION OF BORING								JOB NUMBER		LOCATION		
								604876241. 2017.1.3		APN:		
DATUM..... ELEVATION								DRILLING METHOD: <u>Hand auger: 0-8' bgs</u> <u>Air knife: 0-8' bgs</u> <u>Hollow stem auger: 8.25" O.D.</u>		BORING NUMBER		
								SAMPLING METHOD: <u>Terra Go Kit,</u> <u>Shelly Tube</u>		<u>SBL 0596</u> SHEET <u>1 of 5</u>		
SAMPLER TYPE	FEET DRIVEN / RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		DRILLING	
									ASPHALT		START TIME	FINISH TIME
									DATE	DATE		
							0		ASPHALT			
							1	CH	VERY DK BROWN (10YR 2/2) FAT CLAY w/ TRACE FINE GRAVEL, MOIST, STIFF, HIGH PLASTICITY, DEBRIS (NON-NATIVE), ARTIFICIAL FILL (5, 0, 0, 95)			
					0.1		2	(AF)				
							3		ASPHALT			
							4	SM SC (AF)	DK GREEN GRAY (5Y 14/10) CLAY, SILTY FINE SAND, MOIST, MED. DENSE, GLASS AND OTHER NON-NATIVE DEBRIS, MODERATE CHEMICAL ODOR + STAINING, ARTIFICIAL FILL (0, 60, 20, 20)			
HA	-	1005	4.5-5.0	-	4.1	423855502374	5	CH	V. DK BROWN (10YR 2/2) FAT CLAY w/ TRACE SAND, MOIST, STIFF, HIGH PLASTICITY, STRONG CHEMICAL ODOR (0, 5, 0, 95)			
							6		6.0' - BECOMES DK. YELLOWISH BROWN (10YR 3/6), TRACE GRAVEL (5, 5, 0, 90)			
							7	ML	YELLOWISH BROWN (10YR 5/6) FINE SANDY SILT w/ CLAY - TRACE GRAVEL, MOIST, STIFF, STRONG CHEMICAL ODOR (5, 15, 60, 20)			
HA	-	1040	7.5-8.0	-	2080	438155502375	8		CLEARED TO 8.0' BGS ON 4/24/17			
							9		Shelly Tube pushed from 8.0-9.5' bgs			
ST		1441	8.0-9.5			55502379	10		No recovery 9.5-10' bgs			

By C. Eckert
 Date 4/24/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM..... ELEVATION								DRILLING METHOD: _____		BORING NUMBER <u>SBL0596</u>		
								SAMPLING METHOD: <u>Terra Core Kit, Shelby Tube</u>		SHEET <u>2</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING	
									START TIME	FINISH TIME	DATE	DATE
	3	1450	15.0-18.5		3665	55502380	10	SP	Inferred Contact			
					4581		11		Light olive brown (2.5Y 5/6) poorly sorted fine sand, moist, dense, strong chem. odor			
					3531		12		(0,100,0,0)			
ST		1515	12.5-13.0		4691	55502381	13		shelby Tube pulled from 13.0-15.0' bgs			
		1530	13.0-15.0			55502382	14					
	4	1540			3686		15					
					1608		16					
					762		17					
							18					
	4	1600	19.0-19.5			55502383	19		Increasing fines			
					913		20					

By C. Eckert
 Date 4/24/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION			
DATUM.....								ELEVATION		DRILLING METHOD:		BORING NUMBER <u>SL0596</u>	
										SAMPLING METHOD:		SHEET <u>3</u> of <u>5</u>	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		DRILLING		
											START TIME	FINISH TIME	
							2.0		Grades to:				
					514		2.1	ML	Olive brown (2.5Y 4/3) silt with fine sand, moist, dense, slight chemical odor				
					357		2.2		(0, 20, 80, 0)				
							2.3		Shelby tube pulled from 22.0-25.0				
ST	2	1630	23.0-25.0			SS02384	2.4						
							2.5						
	4	1640			157		2.6						
					214		2.7						
					358		2.8		Increasing fine sand				
					421		2.9		Grades to:				
	4	1650					3.0	SP	Olive brown (2.5Y 4/4) poorly graded silted fine sand, dense, slight chemical odor, moist (0, 100, 0, 0)				

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER 60487624		LOCATION			
DATUM										ELEVATION		DRILLING METHOD:		BORING NUMBER SBL0596	
												SHEET 4 of 5			
										SAMPLING METHOD:		DRILLING			
										SURFACE CONDITIONS:		START TIME		FINISH TIME	
												DATE		DATE	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH							
		1700	30.0-30.5		158	SSS02386	30								
					394		31								
					79.0		32								
ST	2	1720	33.0-33.0		38.5	SSS02387	33		Very pale brown (10YR 7/3) well sorted sand, slightly moist, moderately dense, slight odor (0, 100, 0, 0) Shelby Tube pushed from 33.0-35.0						
							34		Inferred Contact						
							35		End drilling operation for 4/24/17 @ 1730 Resume drilling operation on 4/25/17 @ 0815						
4	4	0830	35.0-35.5		155	SSS02388	35								
					681		36		SP Light olive brown (2.5Y 5/4) poorly sorted fine sand, moist, dense, moderate chemical odor, trace fines (0, 95, 5, 0)						
							37								
							38								
ST	2	1.7	39.0-40.7		1008	SSS02389	39		Shelby tube pushed from 39.0-40.7						
							40								

BORING LOG

LOCATION OF BORING

JOB NUMBER

60487624

LOCATION

DRILLING METHOD:

BORING NUMBER

SKL0596

SHEET

5 of 5

SAMPLING METHOD:

DRILLING

START TIME

0900

FINISH TIME

DATE

4/25/17

DATUM.....

ELEVATION

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH
ST		0810	39.0-40.7			55502389	40	SP
	2 2				1420		41	
					1354		42	
		0900	42.5-43.0		2446 596	55502395	43	
							4	
							5	
							6	
							7	
							8	
							9	
							0	

No recovery 40.7-41.0' bgs

Area with increased fines, SP-5M, silty sand

Drilling operations ceased at 0900, 4/25/17

T.D: 43.0' bgs

3rd hole backfilled with 17.5 50-lb bags of Enviroplug medium bentonite chips hydrated and completed with cold patch asphalt to 0.5' bgs

Standard boring log form

By R. SHORE, C. Eckert
 Date 4/27/17 Checked by _____

Drilling Contractor GREEN DRILLING

BORING LOG

LOCATION OF BORING								JOB NUMBER		LOCATION		
								60487624.2017.1.3		APN: 7351-035-057		
DATUM..... ELEVATION								DRILLING METHOD: <u>HAND AUGER: 0-8' logs</u> <u>Direct push geoprobe Limited Access Rig</u>		BORING NUMBER <u>SBL0597</u>		
								SAMPLING METHOD: <u>TERRACORE KITS</u>		SHEET 1 of 5		
								DRILLING				
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		START TIME	FINISH TIME
									<u>ASPHALT</u>		DATE	DATE
											4/27/17	4/27/17
							0		ASPHALT			
							0.2	GW	COMPACTED GRAVEL BASE ROCK			
							1	CL	V. DK BROWN (10YR 2/2) SILTY, SANDY CLAY w/ GRAVEL, MOIST, STIFF, NON-MATTE DEBRIS, ARTIFICIAL FILL, MED PLASTICITY (15, 25, 25, 35)			
							1.1	SM	LT OLIVE BROWN (2.5Y 5/4) SILTY FINE SAND w/ TRACE GRAVEL, MOIST, DENSE, V. WEAK CHEMICAL ODOR (5, 60, 35, 0)			
							14.6	CL	GREENISH GREY (6.5Y 15/5G4) SILTY CLAY w/ SAND + TRACE FINE GRAVEL, MOIST, V. STIFF, MODERATE CHEMICAL ODOR + STAINING, MEDIUM PLASTICITY (5, 15, 30, 50)			
HA	-	0825	5.0	-	146.6	SSS02451	5		94.5' - BECOMES DK BROWN (10YR 3/3)			
							14.1	SM	YELLOWISH BROWN (10YR 5/4) SILTY V. FINE SAND w/ TRACE FINE GRAVEL, MOIST, DENSE, WEAK CHEMICAL ODOR, NO STAINING			
							9.5					
HA	-	0835	8.0	-	9.5	SSS02452	8					
	4 3.5				3.3			SM	CLEARED TO 8.0' BES BY HAND AUGER ON 4/27/17 Begin direct push geoprobe drilling at 1215 on 4/27/17 (0, 60, 40, 0)			
							9					
							10					

By C. Eckert
Date 4/27/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION	
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>5120597</u>	
								SAMPLING METHOD: _____		SHEET <u>2</u> of <u>5</u>	
								SURFACE CONDITIONS: _____		DRILLING	
										START TIME	FINISH TIME
										DATE	DATE
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH			
					3.5		10	SM	Yellowish brown (10YR 5/4) silty very fine SAND, moist, dense, no odor or staining (0, 60, 40, 0)		
							11				
							12				
	4/4				1.5		13	SM			
							14				
					1.1		15				
							16				
	4/4						17				
		1245	17.5		3.4	55502469	18		Increasing fines at 17.5' bgs (0, 50, 50, 0)		
					7.8		19				
					4.1		20				

By C. Eckert
 Date 4/27/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING							JOB NUMBER 60487624		LOCATION		
DATUM..... ELEVATION							DRILLING METHOD:		BORING NUMBER SBL0597		
							SAMPLING METHOD:		SHEET 3 of 5		
									DRILLING		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:	START TIME DATE	FINISH TIME DATE
	4 4						20	SM			
					32.0		21		@ 21.5' gravel 1/4-1/2" diameter observed		
					74.7		22		slight abr observed		
		2:05 12:55					23	OE			
			23.5			55502470					
	4 4				106.8		24				
					22.6		25				
					73.8		26				
							27				
	4 2:35	13:10	28.0		81.5	55502471	28				
					6.0		29	SP	Yellowish brown (10YR 5/6) Poorly graded medium sand, moist, dense, no staining or abr		
					9.4				(0, 100, 0, 0)		
					11.6		30				

By C. Eckert
 Date 4/27/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER		LOCATION			
DATUM										ELEVATION		DRILLING METHOD: _____		BORING NUMBER <u>5BL0593</u>	
												SHEET <u>4</u> of <u>5</u>			
										SAMPLING METHOD: _____		DRILLING			
										SURFACE CONDITIONS: _____		START TIME			
												FINISH TIME			
										DATE		DATE			
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH							
							30		No Recovery 30.25-32.0' bgs						
							31		Inferred Contact						
							32	SW	Light brownish gray (10YR 6/2) Very fine to medium well graded SAND, loose, slightly moist, no odor or staining (0, 100, 0, 0)						
	4 27.5				5.0		33								
					24.2		34	ML	Brown (10YR 4/3) Very fine sandy SILT moist, dense, no odor or staining (0, 35, 65, 0)						
					58.5	55502472	35		No recovery 34.75-36.0' bgs						
		1330	34.75				36								
							37	ML							
	4 3				85.7		38	CL	olive brown (2.5Y 4/3) Lean CLAY with sand, moist, stiff, odor (0, 20, 20, 60)						
					181.4		39								
					208.3	55502473	40		Inferred Contact						
		1340	38.0												
					146.7										

By C. Eckert
Date 4/27/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER <u>60487624</u>	LOCATION
										DRILLING METHOD: _____	BORING NUMBER <u>SBL0597</u>
										SAMPLING METHOD: _____	SHEET <u>5</u> of <u>5</u>
DATUM _____ ELEVATION _____										DRILLING	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____	START TIME	FINISH TIME
										DATE	DATE
	<u>4</u> <u>2.5</u>				<u>145.7</u>		<u>40</u>	SP-SM	Inferred contact Olive brown (2.5Y 4/4) Poorly graded fine SAND with SILT, moist, dense, odor (0, 85, 15, 0)		
							<u>41</u>		Grades to:		
		<u>1405</u>	<u>41.5</u>		<u>428.3</u>	<u>5502474</u>	<u>42</u>	SP	strong brown (7.5Y 4/6) Poorly graded fine SAND, moist, dense, odor, reddish streaking (0, 100, 0, 0)		
					<u>87.4</u>		<u>43</u>				
							<u>44</u>				
							<u>5</u>		Boring terminated at 1410 on 4/27/17 T.D. 44.0' bgs Borehole backfilled with 2 50-lb bags of hydrated Enviroplus medium bentonite chips to 0.5' bgs on 2 surface complete with cold patch asphalt to match surface grade.		
							<u>6</u>				
							<u>7</u>				
							<u>8</u>				
							<u>9</u>				
							<u>0</u>				

By R. Shore, C. Edler
 Date 4/26/17 Checked by _____

Drilling Contractor GREEN DRILLING

BORING LOG

LOCATION OF BORING <u>COKE BLDG</u>		JOB NUMBER <u>60487624.2017.1.3</u>		LOCATION APN: <u>7351-034-057</u>					
		DRILLING METHOD: <u>HAND AUGER: 0-8' by Direct push geoprobe Limited casing</u>		BORING NUMBER <u>SBL0598</u>					
		SAMPLING METHOD: <u>TERRACORE KITS</u>		SHEET <u>1</u> of <u>5</u>					
		SURFACE CONDITIONS: <u>ASPHALT</u>		DRILLING START TIME: <u>0800</u> FINISH TIME: <u>1030</u> DATE: <u>4/26/17</u> DATE: <u>4/27/17</u>					
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SOIL DESCRIPTION
							0		ASPHALT
							1	GW	COMPACTED GRAVEL BASE ROCK
					D.O		2	CL	V. DK. BROWN (10% 2/2) SANDY, SILTY CLAY W/ GRAVEL, MOIST, STIFF, NON-NATIVE DEBRIS ARTIFICIAL FILL, LOW PLASTICITY (15, 20, 20, 45)
					1.1		3		
					2.3		4	SM	GREENISH GREY (10% 5/10) SILTY V. FINE SAND W/ TRAIL FINE GRAVEL, MOIST, DENSE, WEAK CHEMICAL ODOR + STRAINING (5, 55, 40, 0)
HA	-	0835	4.5-5.0	-	399.7	SSS02404	5	CL	DK BROWN (10% 3/3) SILTY CLAY W/ SAND AND TRACE GRAVEL, MOIST, V. STIFF, STRONG CHEMICAL ODOR (5, 15, 35, 45)
					3510		6	SM	DK YELLOWISH BROWN (10% 4/6) SILTY FINE SAND, MOIST, DENSE, STRONG CHEMICAL ODOR (0, 60, 40, 0)
							7		
HA	-	0850	7.5-8.0	-	1141	SSS02405	8		CLEARED TO 8.0' BS BY HAND AUGER ON 4/26/17 Direct push geoprobe drilling commenced at 0830 on 4/27/17
	4/3				3430		9		
					4556		10		

By C. Eckert
 Date 4/27/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>SBL0598</u>		
								SAMPLING METHOD: _____		SHEET <u>2</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING	
					SAMPLE				START TIME	FINISH TIME		
									DATE	DATE		
							10	SM				
						4109						
						4108	11		No recovery 11.0 - 12.0' logs			
							12	SM				
						3537	13					
						3156	14					
						3209	15		No recovery 15.0 - 16.0'			
							16	SM				
						1104	17					
							18		Sub-rounded 3/8-1/2" gravels silty fine sand with gravels (15, 55, 30, 0)			
		0900	18.5			1771	19					
							20					
						1346						

By C Eckert
 Date 4/27/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>513L0598</u>		
								SAMPLING METHOD: _____		SHEET <u>3</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		START TIME	FINISH TIME
											DATE	DATE
	4/4						20	SM	Dark yellowish brown (10YR 4/4) Silty fine sand with gravel, moist, dense, odor, gravel 1/4-1/2"			
					918		21		(15, 55, 30, 0)			
							22					
		0910 22.5			1160	55502148	23					
					774		24					
	4/4						25					
					486.3		26					
					1147		27					
							28	SP-SM	Grades to: Yellowish brown (10YR 5/6) Poorly graded sand with silt and gravel, moist, dense, odor, 1/4-1/2" gravel (15, 75, 10, 0)			
	4/4	0925 28.0			3241	55502449	29					
					1391		30	SP	Grades to: Yellowish brown (10YR 5/4) Poorly graded fine sand, moist, dense, odor (0, 100, 0, 0)			

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER 60487624		LOCATION			
DATUM.....										ELEVATION		DRILLING METHOD:		BORING NUMBER 5BL0598 SHEET 4 of 5	
												SAMPLING METHOD:		DRILLING	
												SURFACE CONDITIONS:		START TIME FINISH TIME	
														DATE DATE	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH					
							1615		30	SP					
							1526		31						
4	3	0955	32.0					55502450	32	SW	Light gray (10YR 7/2) well graded SAND, dry, loose, odor (0, 100, 0, 0)				
									33						
			1010	34.0			1582	55502467	34	SM	WET @ 33.75' Sample taken @ 34.0' from wet SW Yellowish brown (10YR 5/4) silty fine SAND, moist, dense, odor (0, 60, 40, 0)				
							1458		35		No recovery 35.0-36.0' bgs				
4	4								36						
							819.6		37	SP	Brown (10YR 4/3) poorly graded fine SAND with trace silt, moist, dense, odor (0, 95, 5, 0)				
							668.2		38						
									39						
			1030	40.0			1743	55502466	40						

By C. Eckert
Date 4/27/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER <u>60487624</u>		LOCATION			
DATUM										ELEVATION		DRILLING METHOD:		BORING NUMBER <u>SBL0598</u>	
												SAMPLING METHOD:		SHEET <u>5</u> of <u>5</u>	
										SURFACE CONDITIONS:		DRILLING			
										START TIME		FINISH TIME			
										DATE		DATE			
												<u>1030</u>			
												<u>4/27/17</u>			
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	<p>Grades to:</p> <p>Grayish brown (2.5Y 5/2) very fine sandy SILT, moist, dense, odor, reddish brown staining (0, 35, 65, 0)</p> <p>Drilling operations ceased at 1030 on 4/27/17 T.D.: 44.0' bgs Borehole backfilled with 2 50-lb bags of hydrated Enviropug medium bentonite chips to 0.5' bgs. Cold patch asphalt to match surface grade.</p>						
	<u>4</u> <u>3</u>						<u>40</u>	<u>SP</u>							
							<u>41</u>	<u>ML</u>							
							<u>42</u>								
							<u>43</u>								
							<u>44</u>								
							<u>5</u>								
							<u>6</u>								
							<u>7</u>								
							<u>8</u>								
							<u>9</u>								
							<u>0</u>								

By R. SHORE, C. EckertDrilling Contractor GRESS DRILLINGDate 4/28/17 Checked by _____**BORING LOG**

LOCATION OF BORING <u>COKE BLDG</u>		JOB NUMBER <u>60487624.2017.1.3</u>		LOCATION APN: <u>7351-034-057</u>							
		DRILLING METHOD: <u>HAND AUGER 10-8 lbs</u>		BORING NUMBER <u>SBL0599</u>							
		Direct push geoprobe Limited Access Rig		SHEET <u>1</u> of <u>5</u>							
DATUM..... <u>φ</u> ELEVATION <u>N</u>		SAMPLING METHOD: <u>TELESCOPE</u>		DRILLING							
SAMPLER TYPE	FEET DRIVEN / FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: <u>ASPHALT</u>	START TIME <u>0800</u>	FINISH TIME <u>1030</u>
										DATE <u>4/28/17</u>	DATE <u>4/28/17</u>
							0	ASPHALT			
							1	GW	COMPACTED GRAVEL BASE ROCK		
					0.4		2	CL	DK YELLOWISH BROWN (10yr 4/4) SILTY, SANDY CLAY w/ GRAVEL, MOIST, STIFF, MED PLASTICITY, NON-NATIVE DEBRIS ARTIFICIAL FILL (15, 25, 25, 35)		
					0.3		3				
					0.5		4	SM	DK YELLOWISH BROWN (10yr 4/6) SILTY SAND w/ CLAY + GRAVEL, MOIST, V. DENSE (15, 40, 30, 15)		
HA	-	0810	5.0	-	0.2	SSS02483	5				
							6	SM	DK YELLOWISH BROWN (10yr 4/6) FINE TO MEDIUM SAND w/ SILT + TRACE FINE GRAVEL, MOIST, DENSE (5, 70, 25, 0)		
							7				
HA	-	0825	8.0	-	0.4	SSS02884	8				
	4/4						9				
					1.2		10				
									CLEANED TO 8.0 BGS BY HAND AUGER		

By C. Eckert
Date 4/28/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION	
DATUM ELEVATION								DRILLING METHOD: _____		BORING NUMBER <u>SBL 0599</u>	
								SAMPLING METHOD: _____		SHEET <u>2</u> of <u>5</u>	
								SURFACE CONDITIONS: _____		DRILLING	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	START TIME	FINISH TIME	
									DATE	DATE	
							10				
					1.2		11				
					14.6		12	SM Yellowish brown (10PR 5/6) Fine to medium SAND with silt, loam, clay, no odor or staining (0, 65, 35, 0)			
	4/4				2.3		13				
							14				
					2.7		15				
							16				
	4/4				1.4		17	SM @ 17.0' bgs increasing fines (0, 55, 45, 0)			
					0.9		18				
							19				
		9920	19.0		2.0	55502479	20				
					0.9						

BORING LOG

Ladd, Standard Stuff, Bonnet, ogf.com

By C. Eckert
 Date 4/28/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487621</u>		LOCATION		
DATUM..... ELEVATION								DRILLING METHOD: _____		BORING NUMBER <u>5320599</u>		
								SAMPLING METHOD: _____		SHEET <u>4</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		START TIME	FINISH TIME
											DATE	DATE
							30	SP	Grader to: Olive (5Y 4/3) Poorly graded fine SAND, moist, dense, odor (0, 100, 0, 0)			
					42.3		31	SW	Grader to: Light olive gray (5Y 6/2) Well graded fine to medium SAND, moist, medium dense (0, 100, 0, 0) No recovery 31.5-32.0' logs			
					26.9		32					
	4	2.5			20.1		33					
					21.5		34	CL	Dark yellowish brown (10YR 4/4) v. fine lean clay with silt, moist, dense, odor (0, 30, 30, 40) No recovery 34.5-36.0' logs			
		1000	33.5		267.8	55502491	35					
					38.2		36					
	4	3			107.2		37	SM	Yellowish brown (10YR 5/6) very fine silty SAND, moist, dense, odor (0, 60, 40, 0)			
					152.5		38					
					132.8		39		No recovery 39.0-40.0' logs Inferred contact			
		620	39.0		192.8	55502493	40					

By C. Eckert
Date 4/28/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER	LOCATION APN:			
DATUM.....								ELEVATION		DRILLING METHOD:	BORING NUMBER SBL0599	
										SAMPLING METHOD:	SHEET 5 of 5	
								SURFACE CONDITIONS:		START TIME	FINISH TIME	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	DATE	DATE	
	4	2.5				147.8		40	CL			
			1035	41.0		218.2	55502494	41				
								42	ML			
						178.3		43				
								44				
								5				
								6				
								7				
								8				
								9				
								0				

Inferred Contact
Olive Gray (5Y 5/2) Lean CLAY with
very fine sand, moist, dense, odor
(0, 20, 30, 50)

Grades to:
Olive Gray (5Y 5/2) mottled with strong
Brown (7.5Y 4/6) sandy SILT, moist,
dense, odor
(0, 40, 60, 0)

Boring terminated at 1070 on 4/28/17.
T.D: 44.0' by 3" Borehole backfilled with
0.5' (50-10) lbs of hydrated lime/plug
medium bentonite chips to 0.5' by 3" and
surface completed with cold-patch
asphalt to match surface grade

By R. SHORE, C. EckertDrilling Contractor GREGG DRILLINGDate 4/27/17 Checked by _____**BORING LOG**

LOCATION OF BORING		JOB NUMBER <u>60487624.2017.1.3</u>		LOCATION APN: <u>7351-034-057</u>	
		DRILLING METHOD: <u>HAND AUGER: 0-8' bgs</u>		BORING NUMBER <u>SBLO600</u>	
		Direct push geoprobe Limited Access Rig		SHEET 1 of 5	
DATUM.....		ELEVATION		SAMPLING METHOD: <u>TECHCORE KITS</u>	
SURFACE CONDITIONS: <u>CONCRETE</u>		START TIME <u>1450</u>		FINISH TIME <u>1100</u>	
DATE <u>4/27/17</u>		DATE <u>5/3/17</u>			

SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SOIL DESCRIPTION
							0		CONCRETE
							1	GW	COMPACTED GRAVEL + SAND BASE ROCK
					0.0		2	CL	V. DK BROWN (10YR 2/2) SILTY, SANDY CLAY W/ GRAVEL, MOIST, STIFF, LOW-MED PLASTICITY, NON-NATIVE DEBRIS ARTIFICIAL FILL (15, 25, 25, 35)
					0.4		3		
					0.5		4		
HA	-	15155.0	-	0.3	SSS02481		5	SM	V. DK BROWN (10YR 2/2) SILTY SAND W/ CLAY + GRAVEL, MOIST DENSE, WEAK CHLORIDE ODOR, NON-NATIVE DEBRIS, ARTIFICIAL FILL (15, 40, 30, 15)
					0.2		6	ML	DK BROWN (10YR 3/3) FINE SANDY SILT W/ TRACE FINE GRAVEL, MOIST V. STIFF, NO ODOR (5, 25, 70, 0)
HA	-	15258.0	-	0.1	SSS02482		7	SM	YELLOWISH BROWN (10YR 5/6) SILTY FINE SAND, MOIST DENSE, NO ODOR (0, 60, 40, 0)
	4/4						8		CLEARED TO 80' BGS BY HAND AUGER ON 4/27/17
					0.3		9	SM	
							10		

By C. Ecker
 Date 5/31/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER		LOCATION		
								60487624				
DRILLING METHOD:								BORING NUMBER		SHEET		
								SBL0620		2 of 5		
SAMPLING METHOD:								DRILLING		START TIME		
										DATE		
DATUM.....								ELEVATION				
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		DATE	DATE
					0.0		10	SM				
							11		@ 11.0' bgs increasing fine SAND (0, 70, 30, 0)			
	4/4				0.0		12					
					0.3		13					
							14	SP-SM	Light olive brown (2.5Y5/4) Poorly graded fine SAND with silt, most, dense, no odor or staining (0, 85, 15, 0)			
					0.0		15					
	4/4				0.0		16					
				28 17.5	0.0		17	OS				
							18					
		1005	19.0		0.0	5550964	19					
					0.0		20					

By C. Eckert
 Date 5/3/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION			
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>SBL 0620</u>			
								SAMPLING METHOD: _____		SHEET <u>3</u> of <u>5</u>			
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING		
									START TIME	FINISH TIME	DATE	DATE	
							20	SP SM					
					0.0		21						
							22						
			1015 23.0		0.0	55502565	23						
					0.0		24						
							25						
					0.0		26	SM	olive brown (5Y4/4) Very fine silty SAND, moist, dense, no odor or staining, trace gravel (5, 75, 20, 0)				
					0.0		27		@26.5' by 1/4-3/4' angular gravels				
			1020 28.0		0.0	55502566	28		@28.2' by color change to olive (5Y4/3)				
							29						
					5.7		30	SP	Olive gray (5Y4/3) Very fine poorly sorted graded SAND, moist, dense, trace silt, odor (0, 95, 5, 0)				

By C. Eckert
 Date 5/3/17 Checked by _____

Drilling Contractor Greg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>58L0620</u>		
								SAMPLING METHOD: _____		SHEET <u>4</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING	
									START TIME	FINISH TIME	DATE	DATE
		1035 1040	30.5 30.5		15.8	55502567 55502568 (b.p.)	30	SP	No recovery 30.5-32.0' bgs			
							31					
							32	SP				
	4 3.5				3.0		33					
					4.0		34	ML	Olive (5Y4/3) sandy SILT, very fine sand, moist, dense, slight odor (0, 40, 60, 0)			
					4.9		35					
					11.5		36		No recovery 35.5-36.0' bgs sandy clay STOP			
	4 4				27.4		37					
					34.9		38	SM	Grades to: Olive gray (5Y4/2) silty very fine SAND, moist, dense, odor (0, 65, 35, 0)			
							39					
		1050	39.0		36.1	55502569	40					
					24.5							

By C. Eckert
Date 5/3/17 Checked by _____

Drilling Contractor Gross Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487 624</u>		LOCATION			
DATUM								ELEVATION		DRILLING METHOD:		BORING NUMBER <u>SBL 0600</u>	
										SAMPLING METHOD:		SHEET <u>5</u> of <u>5</u>	
										DRILLING			
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:		START TIME	FINISH TIME	
											DATE	DATE	
	<u>4</u> <u>3.5</u>				<u>13.2</u>		<u>40</u>	<u>SM</u>	<u>@40.5' bgs 1/4-1/2" gravels observed</u>				
					<u>3.1</u>		<u>41</u>						
							<u>42</u>						
		<u>1100</u>	<u>42.5</u>		<u>14.7</u>	<u>SSS02570</u>	<u>43</u>	<u>ML</u>	<u>Olive gray (GY 5/2) SILT with sand, moist, dense, reddish staining (0, 30, 70, 0)</u>				
					<u>3.5</u>		<u>44</u>		<u>No recovery 43.5-44.0' bgs</u>				
							<u>5</u>		<u>Boring terminated at 1100 on 5/3/17</u>				
							<u>6</u>		<u>T.D. 44.0' bgs. Borehole backfilled with</u>				
							<u>7</u>		<u>1.5 (50-lb) bags of hydrated Enviropus</u>				
							<u>8</u>		<u>medium bentonite chips to 0.5' bgs.</u>				
							<u>9</u>		<u>Surface completed with concrete to match</u>				
							<u>0</u>		<u>existing grade.</u>				

By P. Shore, C. EckertDrilling Contractor Grege DrillingDate 4/28/17 Checked by _____**BORING LOG**

LOCATION OF BORING										JOB NUMBER		LOCATION	
										60487621.2017.1.3		APN: 7351-034-057	
										DRILLING METHOD: <u>HAND AUGER: 0-8'</u>		BORING NUMBER	
										Direct pull geoprabe Limited Access Rig		SBL0601	
										SAMPLING METHOD: <u>FERRACORE KITS</u>		SHEET	
DATUM..... ELEVATION												1 of 5	
										DRILLING			
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:	START TIME	FINISH TIME		
									<u>ASPHALT</u>	<u>1040</u>	<u>0945</u>		
										DATE	DATE		
										<u>4/28/17</u>	<u>5/1/17</u>		
							0	ASPHALT					
							1	GW COMPACTED GRAVEL BASEPCK					
							2	ML V. DK BROWN (10.2/2) SANDY SILT W/ CLAY + GRAVEL, MOIST, STIFF, NON-NATIVE DEBRIS, ARTIFICIAL FILL (15, 30, 40, 15)					
					15.6		3	SM GREENISH GREY (6.1/10.1) SILTY V. FINE SAND W/ GRAVEL, MOIST, DENSE, WEAK CHEMICAL ODOR + STAINING (10, 60, 30, 0)					
					14.6		4	3.5' - BECOMES DRY YELLOWISH BROWN (10.2/4/1)					
HA	-	1135	5.0	-	57.2	SSS02487	5	5.0' - MODERATE CHEMICAL ODOR					
							6	SP YELLOWISH BROWN (10.2/5/4) V. FINE SAND W/ TRACE SILT + GRAVEL, MOIST, DENSE, WEAK CHEMICAL ODOR (5, 90, 5, 0)					
					128.0		7						
					42.0		8	SM YELLOWISH BROWN (10.7/2.5/4) FINE SAND W/ SILT + TRACE GRAVEL, MOIST, DENSE, MODERATE CHEMICAL ODOR (5, 75, 20, 0)					
HA	-	1150	8.0	-	88.0	SSS02488	9	CLEARED TO 8.0' BGS BY HAND AUGER ON 4/28/17					
	4/4						10	Begin direct-pull geoprabe drilling at 0820 on 5/1/17					
					1945								

By C. Eckert
Date 5/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>	LOCATION	
DATUM _____ ELEVATION _____								DRILLING METHOD: _____	BORING NUMBER <u>SBL0601</u>	
								SAMPLING METHOD: _____	SHEET <u>2</u> of <u>5</u>	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	DRILLING	
									SURFACE CONDITIONS: _____	START TIME
									DATE	DATE
							10	SM		
					2535		11		strang odor	
					4742		12			
	4 2.5				6999		13			
							14			
					2278		15		No recovery 14.5-16.0' bgs	
							16			
	4 4						17		SM @ 16.0' bgs observed color change to: olive brown (2.5Y 4/3) @ 16.5': 2" dia. or large angular gravel	
		0845	17.5		31.3	SSS02501	18			
					151.2		19			
					111.5		20			

By C. Eckert
 Date 5/1/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER <u>60487624</u>		LOCATION	
DATUM _____ ELEVATION _____										DRILLING METHOD: _____		BORING NUMBER <u>SL20601</u>	
										SAMPLING METHOD: _____		SHEET <u>3</u> of <u>5</u>	
										SURFACE CONDITIONS: _____		DRILLING	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH		START TIME	FINISH TIME		
										DATE	DATE		
							20						
	4/4						21	CL	Light olive brown (2.5Y 5/4) sandy lean CLAY with gravel, moist, stiff, very fine sand, rounded 1/4-1/2" gravel, a bit				
		0855	21.5		108.3	55102489							
							22		(5, 25, 25, 45)				
					84.6		23						
					60.3		24						
	4/2.5						25		@ 25.0' bgs increasing sand (5, 30, 25, 40)				
					128.9		26						
					76.3		27						
							28	SW	Interred contact				
	4/2.5				78.3		29		Light brownish gray (2.5Y 6/2) well graded fine to medium SAND, moist, loose, (0, 100, 0, 0)				
		0915	29.5		120.4		30						

By C. Edler
 Date 5/11/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION		
DATUM _____ ELEVATION _____								DRILLING METHOD: _____		BORING NUMBER <u>SL 0601</u>		
								SAMPLING METHOD: _____		SHEET <u>4</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		DRILLING	
									START TIME	FINISH TIME	DATE	DATE
							30					
					96.4		31					
							32	SW				
4	3	0920	32.0		211.1	55502502	33					
					771.9		34	ML	Grades to: Olive brown (2.5Y4/4) very fine sandy SILT, moist, dense, odor (0, 35, 65, 0)			
					321.3		35					
					367.2		36					
							37	SM	No recovery 35.0-36.0' bgs Inferred contact			
4	4				123.3		38		Olive brown (2.5Y4/3) silty SAND, very fine sand, moist, dense, trace rounded gravels, odor (5, 70, 25, 0)			
					219.2		39		3/8-3/4" rounded gravels observed @ 38.5' bgs			
		0930	39.0			55502503	40					
					360.2							

By C. Eckert
 Date 5/1/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER 60488624		LOCATION	
DATUM _____ ELEVATION _____										DRILLING METHOD: _____		BORING NUMBER SBL0601	
										SAMPLING METHOD: _____		SHEET 3 of 5	
												DRILLING	
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		START TIME 0945	FINISH TIME 0945	
										DATE 5/1/17	DATE		
	4 4						40	SM					
						247.8	41		@41.0' bgs 1/2-3/4" angular gravel observed				
							42	ML	Olive (5Y 4/3) sandy SILT, very fine sand, moist, strong odor (0, 35, 65, 0)				
		0945	42.5			272.0	43						
						161.2	44						
							5		Boring terminated @ 0945 on 5/1/17. T.D. 44.0' bgs. Borehole was backfilled with 2 (50-lb) bags of hydrated Enviropug med. bentonite chips to 0.5' bgs. Surface completed with cold patch asphalt to match surface grade.				
							6						
							7						
							8						
							9						
							0						

By R. SHOREDrilling Contractor GREGG DRILLINGDate 4/28/17 Checked by _____**BORING LOG**

LOCATION OF BORING							JOB NUMBER		LOCATION		
							60187624. 2017.1.3		APN: 7351-034-057		
							DRILLING METHOD: <u>HAND AUGER: 0-8' by Direct push Geoprobe Limited Access Rig</u>		BORING NUMBER		
									SBLO602		
							SAMPLING METHOD: <u>TELLURIDE KISS</u>		SHEET		
									1 of 5		
DATUM.....							ELEVATION		DRILLING		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:	START TIME	FINISH TIME
									<u>ASPHALT</u>	<u>0845</u>	<u>1215</u>
										DATE	DATE
										<u>4/28/17</u>	<u>4/28/17</u>
							0	ASPHALT			
							1	GW (COMPACTED) GRAVEL BASE ROCK			
					0.2		2	ML DK BROWN (10YR 3/3) SANDY SILT w/ CLAY + GRAVEL, MOIST, STIFF, NON-NATIVE DEBRIS, ARTIFICIAL FILL (15, 30, 40, 15)			
					1.2		3	SM GREENISH GREY (GLAY 1.5/10Y) SILTY V. FINE SAND w/ GRAVEL, MOIST, DENSE, WEAK CHEMICAL ODOR + STAINING (15, 55, 30, 0)			
					0.3		4	@ 3.5' - BECOMES DK YELLOWISH BROWN (10YR 3/6), NO ODOR			
HA	-	905	5.0	-	0.4	SS502485	5	SP YELLOWISH BROWN (10YR 5/6) FINE SAND w/ GRAVEL + TRACE SILT, MOIST, DENSE, NO ODOR (15, 80, 5, 0)			
					95.0		6	SM YELLOWISH BROWN (10YR 5/4) SILTY FINE SAND w/ TRACE FINE GRAVEL, MOIST, STIFF, MODERATE CHEMICAL ODOR (5, 55, 40, 0)			
							7				
HA	-	1020	8.0	-	2,286	SS502486	8	@ 7.5' - STRONG CHEMICAL ODOR			
	4/4						9	CLEARED TO 8.0' BOS BY HAND AUGER ON 4/28/17			
					9704		10	Commence direct push drilling and sampling at 1100 on 4/28/17			

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING										JOB NUMBER 60487624		LOCATION APN:			
DATUM.....										DRILLING METHOD:		BORING NUMBER 5320602			
										SAMPLING METHOD:		SHEET 2 of 5			
ELEVATION										DRILLING		START TIME		FINISH TIME	
										SURFACE CONDITIONS:		DATE		DATE	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID	SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH					
									10	SM					
									11						
									12						
	4	2.5						1006							
								1874							
								789.0							
									13						
									14						
								2552			Odor				
									15		No recovery 14.5-16.0' bgs				
									16						
	4	4						1452			@16.0' bgs becomes (544/3) olive				
								1803							
									17						
									18						
								1221							
			1120	19.0				2995							
								55502496	19						
									20						
								1349							

By C. Eckert
Date 4/28/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>	LOCATION APN:			
DATUM..... ELEVATION								DRILLING METHOD:	BORING NUMBER <u>SBL0692</u>			
								SAMPLING METHOD:		SHEET <u>3</u> of <u>5</u>		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS:	START TIME	FINISH TIME	
										DATE	DATE	
							20	SM	olive brown (2.5Y 4/4) silty very fine SAND, moist, dense, odor (0,55,45,0)			
	4/4				149.1		21					
					361.2		22					
					376.2		23					
					184.4		24					
	4/4				467.7		25	SM				
							26					
					387.2		27					
					57.7		28					
	4/2				335.7		29					
		1:45	25.5		299.3	55502497	30	SLW	Grader to: Light gray (2.5Y 7/2) well graded fine to medium SAND, moist, medium dense, odor (0,100,0,0)			

By C. Eckert
Date 4/28/17 Checked by _____

Drilling Contractor Gress Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>		LOCATION APN: _____		
DATUM..... ELEVATION								DRILLING METHOD: _____		BORING NUMBER <u>SBL0602</u>		
								SAMPLING METHOD: _____		SHEET <u>4</u> of <u>5</u>		
								SURFACE CONDITIONS: _____		DRILLING		
										START TIME FINISH TIME		
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH			DATE	DATE
							30		No recovery 30.0-32.0' bgs			
							31					
							32	SW				
	4 2.5				1887				Grades to: Olive (5Y5/3) silty fine SAND, moist, dense, odor (0,60,40,0)			
		1200	33.5		1854	55502498	33	SM				
							34					
					386.5				No recovery 34.5-36.0' bgs			
							35					
							36					
	4 4							SM				
					1773		37					
							38		@ 37.0' bgs 1/2-3/4' rounded gravel			
							39					
		1215	39.0		2584	55502499						
							40					
					362.2							

By C. Eckert
Date 4/28/17 Checked by _____

Drilling Contractor Gregg Drilling

BORING LOG

LOCATION OF BORING								JOB NUMBER <u>60487624</u>	LOCATION APN: _____			
DATUM..... ELEVATION								DRILLING METHOD: _____	BORING NUMBER <u>5BL0602</u>			
								SAMPLING METHOD: _____		SHEET <u>5</u> of <u>5</u>		
								DRILLING				
SAMPLER TYPE	FEET DRIVEN FEET RECOVERED	TIME	SAMPLE DEPTH	BLOWS/FT. SAMPLER	PID SAMPLE	SAMPLE NUMBER	DEPTH (feet)	SOIL GRAPH	SURFACE CONDITIONS: _____		START TIME	FINISH TIME
											DATE	DATE
							40					
	4 2				291.8		41					
		1225	41.0		369.2	55502500						
					152.5		42					
							43					
							44					
							5					
							6					
							7					
							8					
							9					
							0					

Increasingly finer @ 41.0' bgs (0, 50, 50, 0)

No recovery: 42.0-44.0' bgs

Boring terminated at 1215 on 4/28/17
T.D. 44.0' bgs. Borehole was backfilled
with 2 (50-lb) bags of hydrated Enviropus
medium bentonite chips to 0.5' bgs.
Surface completed with cold patch asphalt
to match existing grade.

ATTACHMENT 8

ROI, Soil Permeability and Pore Gas Velocity Calculations

Del Amo OU1 SVE Pilot Study

4/2/2018 4:55 PM

Test Run: SVE-1A (Shallow) (without VM-1A); end of stepped rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	8	ft	Screened Interval Thickness (feet)
Top of Screen:	7	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

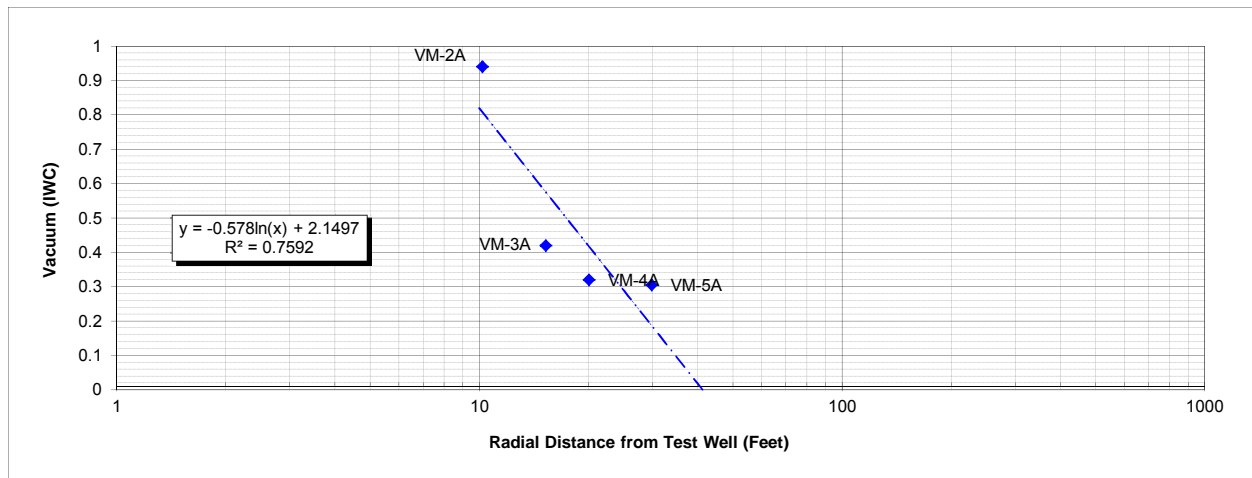
Q	7.99	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-234	Well Pressure (vacuum; IWC)
Pwa	0.425	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-2A	10.21	7	0.94
2	VM-3A	15.25	7	0.42
3	VM-4A	20.08	7	0.32
4	VM-5A	29.888	7	0.305
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-0.5778851	2.149742406	0.7592
x-intercept @ y=0.5 IWC		
17.37	feet	

air permeability (k_{air}):	
2.421E-09	cm ²
0.242	Darcy



Del Amo OU1 SVE Pilot Study

Test Run: SVE-1A (Shallow) (without VM-1A); end of stepped rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

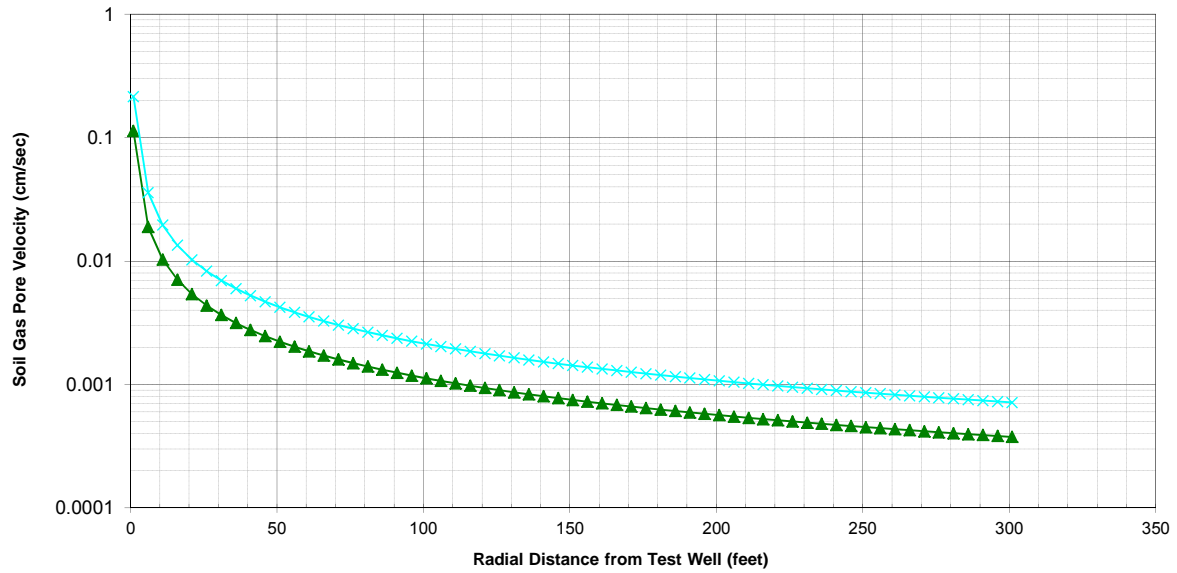
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.38	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{total} = 0.38$

SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{air} = 0.2$

Del Amo OU1 SVE Pilot Study

4/3/2018 4:00 PM

Test Run #3: SVE-1A (Shallow) (without VM-1A); day 1 constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	8	ft	Screened Interval Thickness (feet)
Top of Screen:	7	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

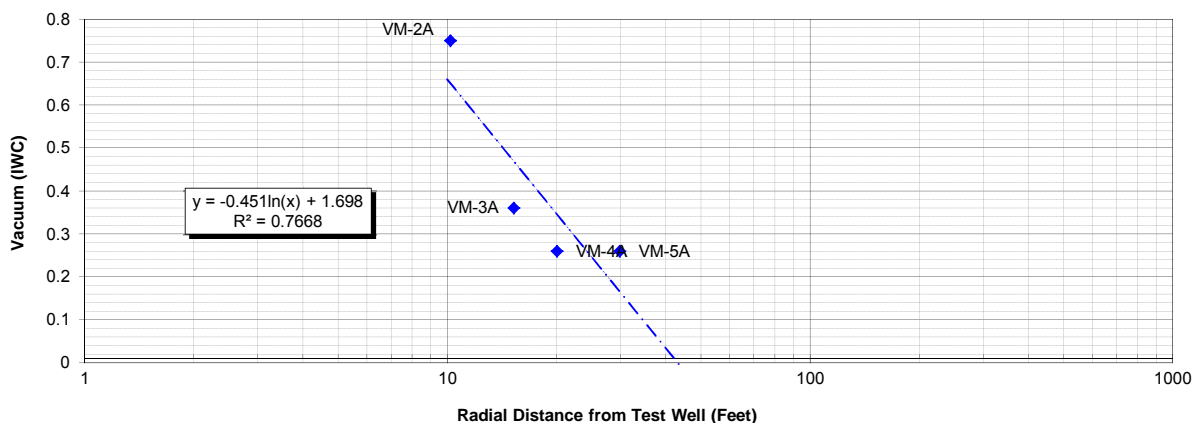
Q	13.3	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-156.5	Well Pressure (vacuum; IWC)
Pwa	0.615	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-2A	10.21	7	0.75
2	VM-3A	15.25	7	0.36
3	VM-4A	20.08	7	0.26
4	VM-5A	29.888	7	0.26
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-0.4510381	1.698047349	0.7668
x-intercept @ y=0.5 IWC		
14.24	feet	

air permeability (k_{air}):	
7.412E-09	cm ²
0.741	Darcy



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Test Run #3: SVE-1A (Shallow) (without VM-1A); day 1 constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

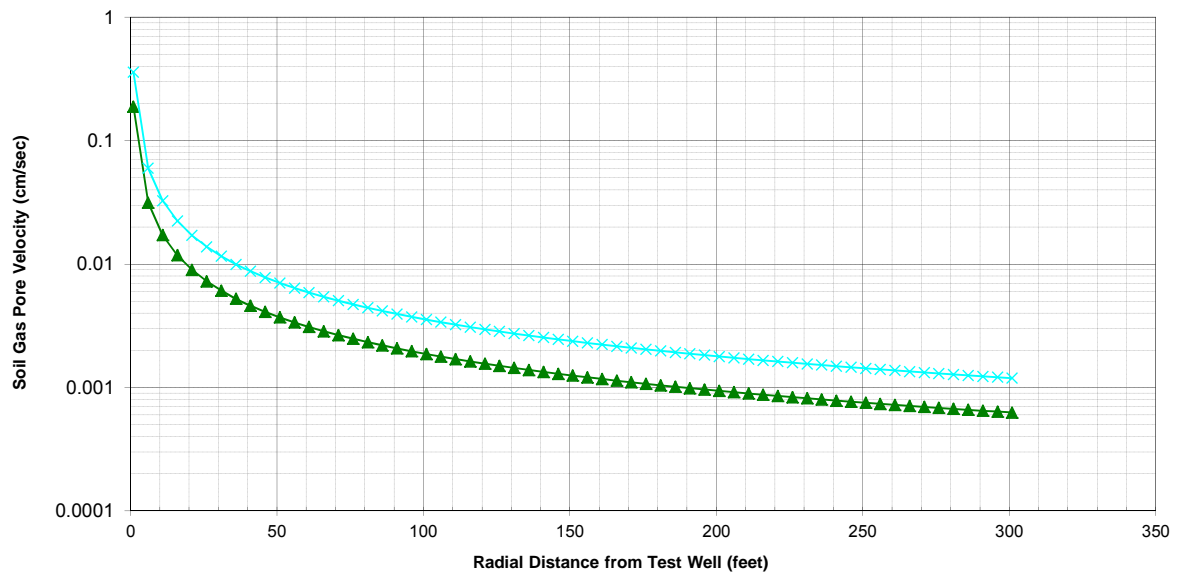
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.38	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-(
cm/sec); θ -total = 0.38

—x— SG Vel(r) (Q/Cyl S.A.)-(
cm/sec); θ -air = 0.2

Del Amo OU1 SVE Pilot Study

4/4/2018 4:45 PM

Test Run #4: SVE-1A (Shallow) (without VM-1A); day 2 constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	8	ft	Screened Interval Thickness (feet)
Top of Screen:	7	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

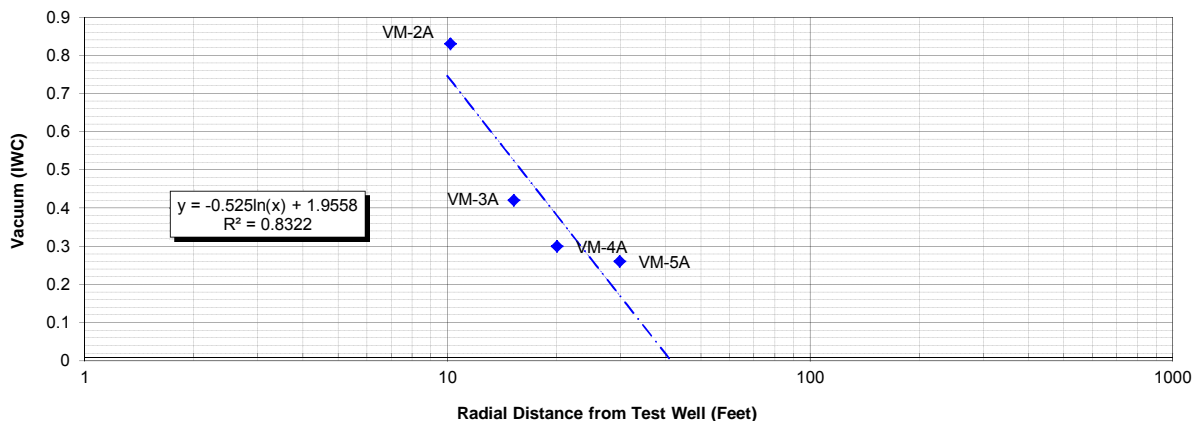
Q	11.4	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-156.50	Well Pressure (vacuum; IWC)
Pwa	0.615	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-2A	10.21	7	0.83
2	VM-3A	15.25	7	0.42
3	VM-4A	20.08	7	0.3
4	VM-5A	29.888	7	0.26
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-0.5253808	1.955762599	0.8322
x-intercept @ y=0.5 IWC		
15.97	feet	

air permeability (k_{air}):	
6.495E-09	cm ²
0.650	Darcy



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Test Run #4: SVE-1A (Shallow) (without VM-1A); day 2 constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

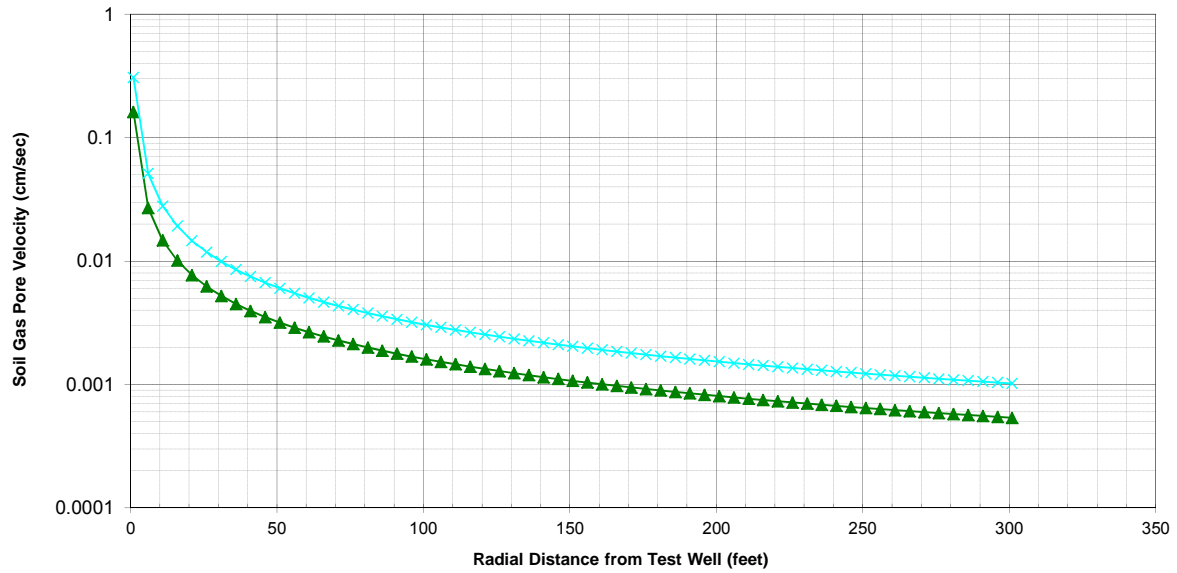
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.38	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



SG Vel(r) (Q/Cyl S.A.)-(
cm/sec); θ -total = 0.38

SG Vel(r) (Q/Cyl S.A.)-(
cm/sec); θ -air = 0.2

Del Amo OU1 SVE Pilot Study

4/5/2018 4:50 PM

Test Run #5: SVE-1A (Shallow) (without VM-1A); day 3 constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	8	ft	Screened Interval Thickness (feet)
Top of Screen:	7	ft	

The solution for k is as follows:

$$k := \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

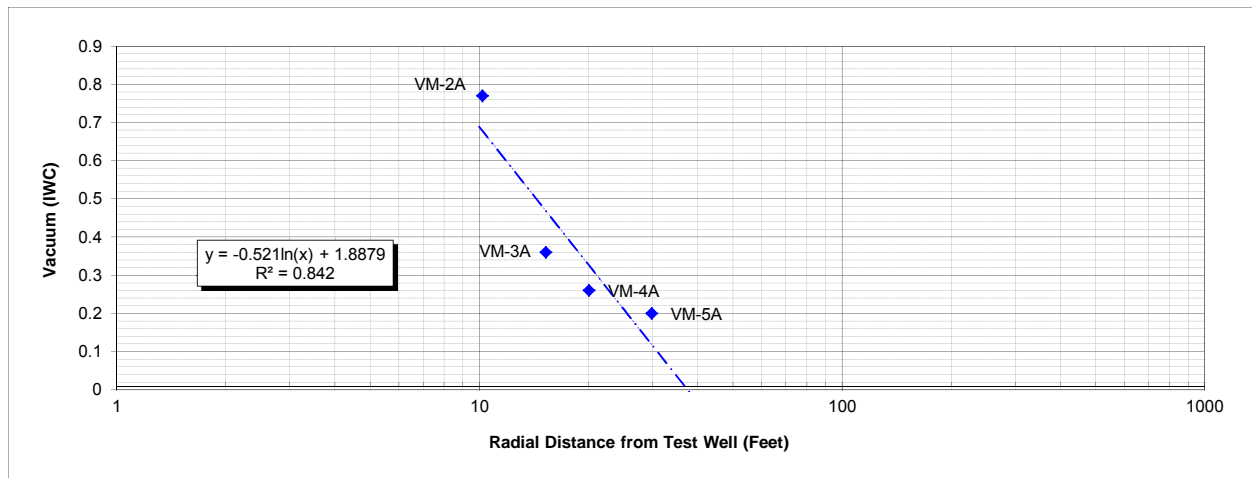
Q	8.15	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-149.70	Well Pressure (vacuum; IWC)
Pwa	0.632	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-2A	10.21	7	0.77
2	VM-3A	15.25	7	0.36
3	VM-4A	20.08	7	0.26
4	VM-5A	29.888	7	0.2
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-0.5208763	1.88787407	0.8420
x-intercept @ y=0.5 IWC		
14.36	feet	

air permeability (k_{air}):	
4.835E-09	cm ²
0.484	Darcy



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Test Run #5: SVE-1A (Shallow) (without VM-1A); day 3 constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

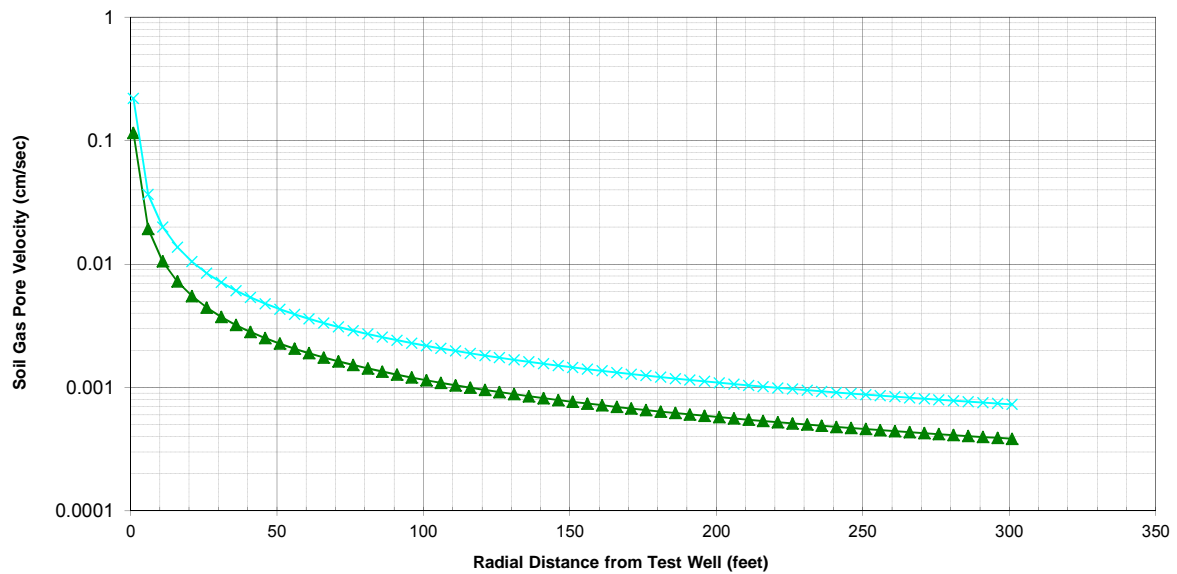
From Stumpf, 1992:

$$U_{tj} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^{0.5}}$$

Assume:

θ_t :	0.38	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{total}} = 0.38$

—×— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{air}} = 0.2$

Del Amo OU1 SVE Pilot Study

4/6/2018 2:45 PM

Test Run #6: SVE-1A (Shallow) (without VM-1A); end of constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	8	ft	Screened Interval Thickness (feet)
Top of Screen:	7	ft	

The solution for k is as follows:

$$k := \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

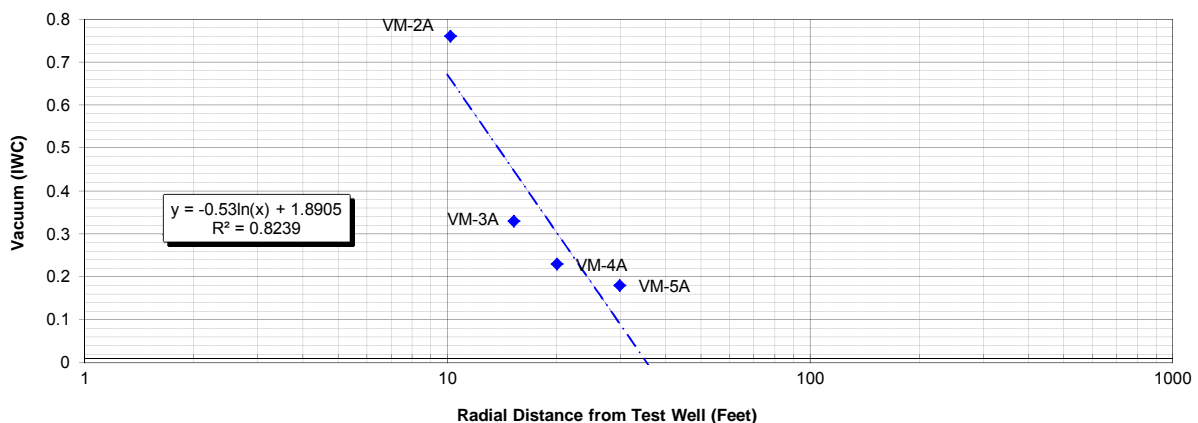
Q	9.58	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-163.30	Well Pressure (vacuum; IWC)
Pwa	0.599	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-2A	10.21	7	0.76
2	VM-3A	15.25	7	0.33
3	VM-4A	20.08	7	0.23
4	VM-5A	29.888	7	0.18
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-0.5296556	1.890494114	0.8239
x-intercept @ y=0.5 IWC		
13.81	feet	

air permeability (k_{air}):	
4.999E-09	cm ²
0.500	Darcy



Del Amo OU1 SVE Pilot Study

Test Run #6: SVE-1A (Shallow) (without VM-1A); end of constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

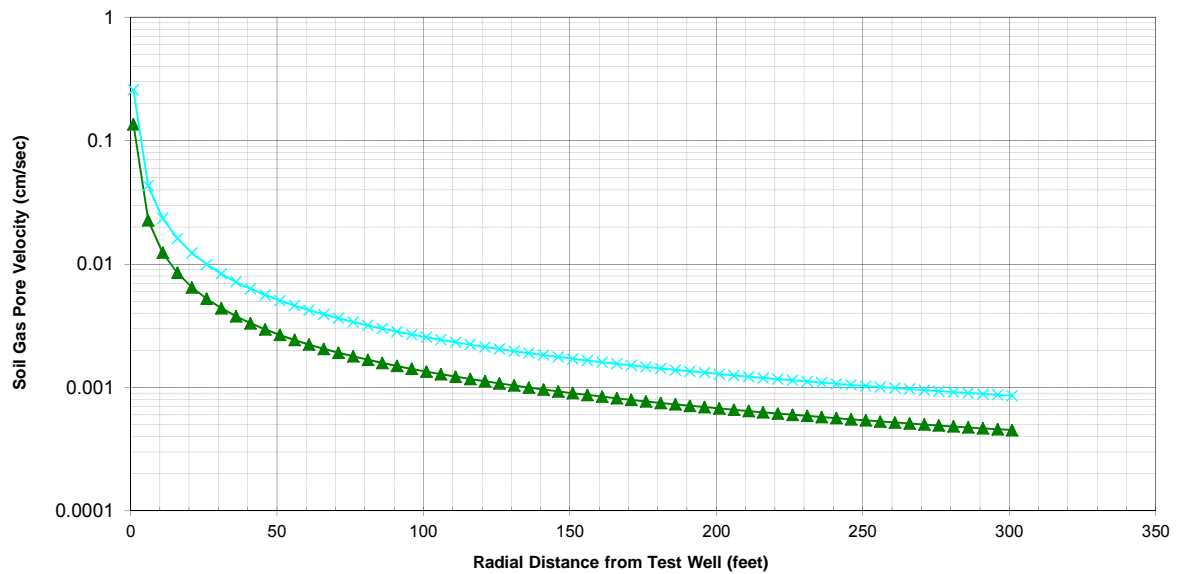
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.38	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{total}} = 0.38$

—×— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{air}} = 0.2$

Del Amo OU1 SVE Pilot Study

4/11/2018 4:30 PM

Test Run #10: SVE-1B (Deep) (all data); end of day 3 constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	22	ft	Screened Interval Thickness (feet)
Top of Screen:	20	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

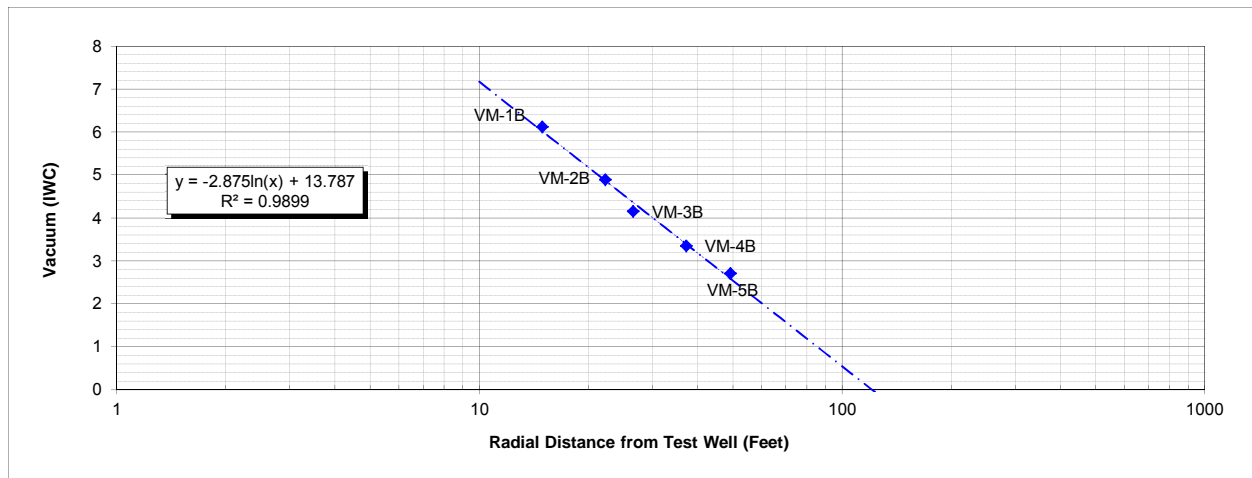
Q	69	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-52.00	Well Pressure (vacuum; IWC)
Pwa	0.872	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-1B	14.92	20	6.12
2	VM-2B	22.25	20	4.89
3	VM-3B	26.58	19	4.15
4	VM-4B	37.17	20	3.35
5	VM-5B	49.25	20	2.71
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-2.8748245	13.78704606	0.9899
x-intercept @ y=0.5 IWC		
101.68	feet	

air permeability (k_{air}):	
7.115E-08	cm ²
7.115	Darcy



Del Amo OU1 SVE Pilot Study

Test Run #10: SVE-1B (Deep) (all data); end of day 3 constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

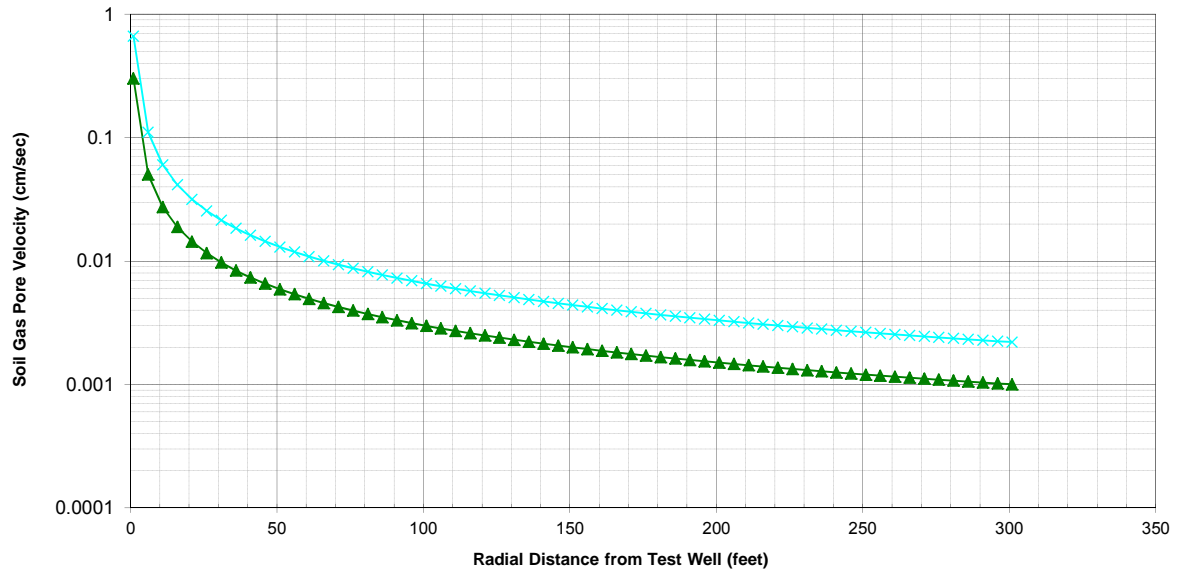
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.44	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{total}} = 0.44$

—×— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{\text{air}} = 0.2$

Del Amo OU1 SVE Pilot Study

4/12/2018 5:00 PM

Test Run #11: SVE-1B (Deep) (all data); end of day 4 constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	22	ft	Screened Interval Thickness (feet)
Top of Screen:	20	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

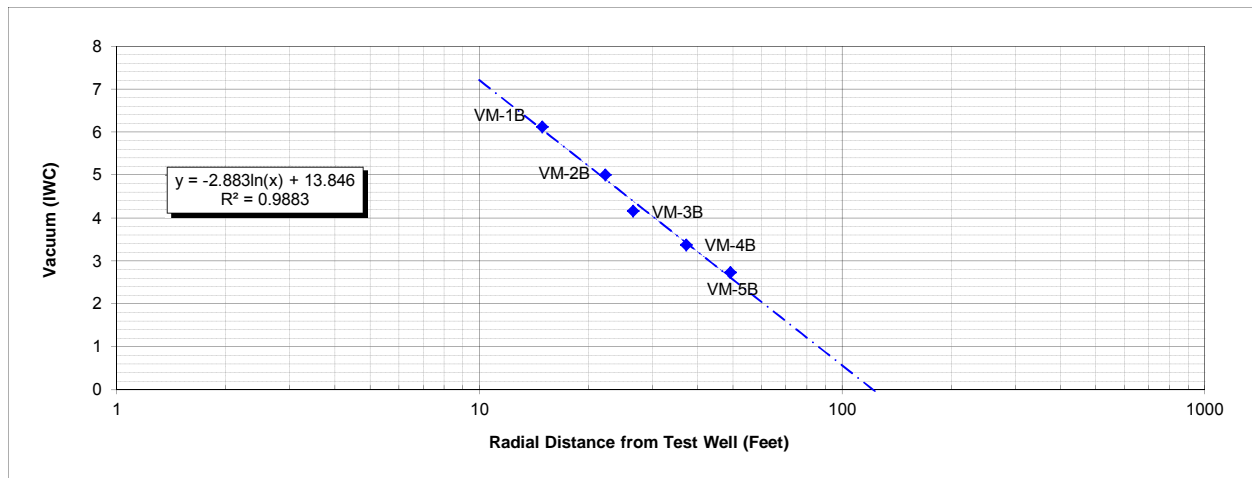
Q	67	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-52.00	Well Pressure (vacuum; IWC)
Pwa	0.872	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-1B	14.92	20	6.12
2	VM-2B	22.25	20	5
3	VM-3B	26.58	19	4.16
4	VM-4B	37.17	20	3.37
5	VM-5B	49.25	20	2.73
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-2.8828421	13.84566057	0.9883
x-intercept @ y=0.5 IWC		
102.45	feet	

air permeability (k_{air}):	
6.916E-08	cm ²
6.916	Darcy



Del Amo OU1 SVE Pilot Study

Test Run #11: SVE-1B (Deep) (all data); end of day 4 constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

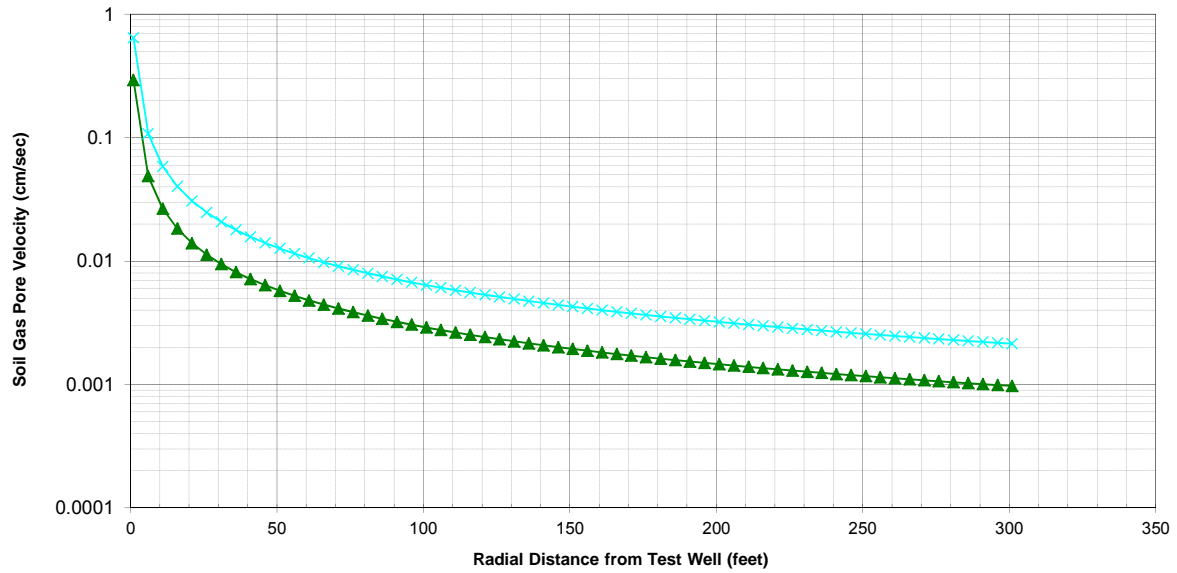
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.44	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{total} = 0.44$

—×— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{air} = 0.2$

Del Amo OU1 SVE Pilot Study

4/13/2018 11:40 AM

Test Run #12: SVE-1B (Deep) (all data); end of constant rate test

From: Johnson et al., 1990. An analytical method for k - air permeability - assuming flow conditions are at steady state or near-steady state.

Test Well Conditions

Rw:	1	in	(radius of well in inches)
H:	22	ft	Screened Interval Thickness (feet)
Top of Screen:	20	ft	

The solution for k is as follows:

$$k = \frac{Q \cdot \mu_{\text{air}} \cdot \ln\left(\frac{R_w}{R_i}\right)}{H \cdot \pi \cdot P_{wa} \cdot \left[1 - \left(\frac{P_{\text{atm}}}{P_{wa}}\right)^2\right]}$$

Well Flow

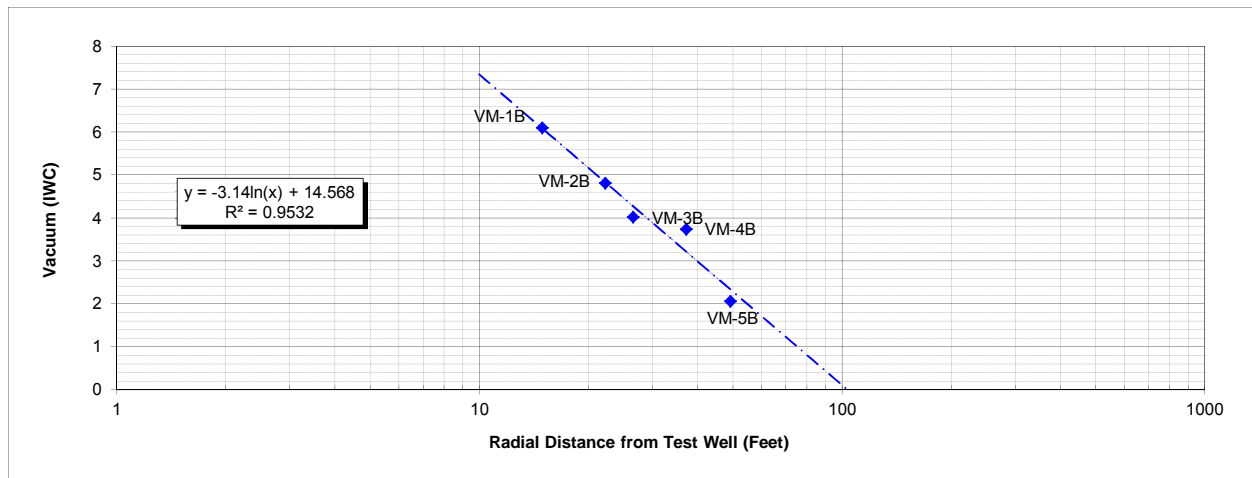
Q	72	Well Flow (SCFM)
Patm	1	Atmospheric Pressure (ATM)
Pwg	-52.00	Well Pressure (vacuum; IWC)
Pwa	0.872	Well Absolute Pressure (ATM)
μ_{air}	1.80E-04	viscosity of air (gm/cm ⁻¹ * sec)

Monitoring Point Data

	Well ID	Distance from Test Well (ft)	Depth to Top of Screen (Feet)	Vacuum (IWC)
1	VM-1B	14.92	20	6.1
2	VM-2B	22.25	20	4.81
3	VM-3B	26.58	19	4.02
4	VM-4B	37.17	20	3.74
5	VM-5B	49.25	20	2.06
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

slope(m)	intercept (b)	R ²
-3.139528	14.56773537	0.9532
x-intercept @ y=0.5 IWC		
88.31	feet	

air permeability (k_{air}):	
7.277E-08	cm ²
7.277	Darcy



Del Amo OU1 SVE Pilot Study

Test Run #12: SVE-1B (Deep) (all data); end of constant rate test

Estimated of Soil Gas Velocity as a function of Radial Distance

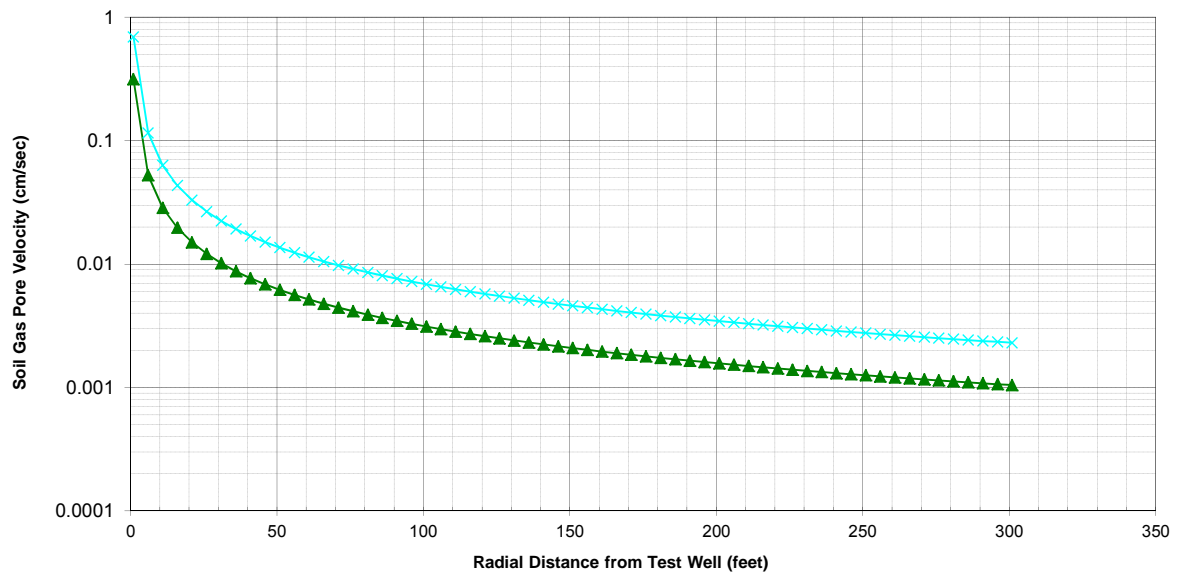
From Stumpf, 1992:

$$U_{t_j} := \frac{-k \cdot \left(\frac{P_{wa}}{\text{rad}_j \cdot \ln\left(\frac{R_w}{R_i}\right)} \right) \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right]}{2\mu_{air} \cdot \theta_t \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_{wa}} \right)^2 \right] \cdot \frac{\ln\left(\frac{\text{rad}_j}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)} \right]^5}$$

Assume:

θ_t :	0.44	total porosity
θ_a :	0.2	air-filled porosity
Minimum radius	1	ft
Maximum radius	300	ft
Increment	5	ft

Soil Gas Pore Velocity versus Radial Distance From Well



—▲— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{total} = 0.44$

—×— SG Vel(r) (Q/Cyl S.A.)-
(cm/sec); $\theta_{air} = 0.2$

ATTACHMENT 9

Pre-design Investigations Soil Sampling Data

TABLE 1
PROPERTY 23 SHALLOW SOIL VOC DATA
Pre-design Investigation
Soil and NAPL Operable Unit
Del Amo Superfund Site

Area	Boring	Sample	Depth (ft bgs)	Detected VOC Concentrations (µg/kg)																						
				Acetone	Benzene	Bromoform	2-Butanone (MEK)	n-Butylbenzene	sec-Butylbenzene	Carbon Disulfide	Chloromethane	Cyclohexane	Ethylbenzene	Isopropylbenzene (Cumene)	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	Styrene	PCE	Toluene	1,1,2-Trichloro- 1,2,2-trifluoroethane (Freon 113)	TCE	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	o-Xylene	p/m-Xylene
Northwest	SBL0578	SSS02522	5.0	18 J	<0.74	<3.7	<15	<0.74	<0.74	<7.4	<15	<37	<0.74	<0.74	<0.74	<7.4	<1.5	<0.74	6.5	<0.74	<7.4	<1.5	<1.5	<1.5	<0.74	<1.5
		SSS02523	8.0	14 J	<0.89	<4.4	<18	<0.89	<0.89	<8.9	<18	<44	0.14 J	<0.89	<0.89	<8.9	<1.8	<0.89	2.4	<0.89	<8.9	<1.8	<1.8	<1.8	<0.89	<1.8
		SSS02525	12.0	9.2 J	0.13 J	1.7 J	<18	<0.91	<0.91	<9.1	<18	<46	<0.91	<0.91	<0.91	<9.1	<1.8	<0.91	1.0	<0.91	<9.1	<1.8	<1.8	<1.8	<0.91	<1.8
		SSS02526	14.5	6.9 J	<0.83	<4.2	<17	<0.83	<0.83	<8.3	<17	<42	<0.83	<0.83	<0.83	<8.3	<1.7	<0.83	<0.83	<0.83	<8.3	<1.7	<1.7	<1.7	<0.83	<1.7
	SBL0579	SSS02537	1.5	44	0.33 J	<4.4	<18	<0.88	<0.88	1.9 J	<18	<44	<0.88	<0.88	<0.88	<8.8	<1.8	<0.88	140	<0.88	<8.8	<1.8	<1.8	<1.8	<0.88	<1.8
		SSS02538	5.0	20 J	<0.98	<4.9	<20	<0.98	<0.98	<9.8	<20	<49	<0.98	<0.98	<0.98	<9.8	<2.0	<0.98	6.8	<0.98	<9.8	<2.0	<2.0	<2.0	<0.98	<2.0
		SSS02540	10.0	8.2 J	0.40 J	<3.8	<15	<0.76	<0.76	<7.6	<15	<38	<0.76	<0.76	<0.76	<7.6	<1.5	<0.76	1.1	<0.76	<7.6	<1.5	<1.5	<1.5	<0.76	<1.5
		SSS02542	14.5	<49	0.23 J	<4.9	<20	<0.98	<0.98	<9.8	<20	<49	<0.98	<0.98	<0.98	<9.8	<2.0	<0.98	<0.98	<0.98	<9.8	<2.0	<2.0	<2.0	<0.98	<2.0
	SBL0580	SSS02397	4.5	8.8 J	0.21 J	<3.4	<14	<0.68	<0.68	<6.8	<14	<34	0.17 J	<0.68	<0.68	<6.8	<1.4	<0.68	<0.68	<0.68	<6.8	<1.4	<1.4	<1.4	<0.68	<1.4
		SSS02398	7.5	6.3 J	0.35 J	<4.1	<16	<0.81	<0.81	<8.1	<16	<41	<0.81	<0.81	<0.81	<8.1	<1.6	<0.81	0.20 J	<0.81	<8.1	<1.6	<1.6	<1.6	<0.81	<1.6
		SSS02512	10.0	12 J	0.24 J	<4.8	<19	<0.96	<0.96	<9.6	<19	<48	0.22 J	<0.96	<0.96	<9.6	<1.9	<0.96	<0.96	<0.96	<9.6	<1.9	<1.9	<1.9	<0.96	<1.9
	SBL0581	SSS02402	4.5	9.1 J	<0.80	<4.0	<16	<0.80	<0.80	<8.0	<16	<40	<0.80	<0.80	<0.80	<8.0	<1.6	<0.80	0.97	<0.80	<8.0	<1.6	<1.6	<1.6	<0.80	<1.6
		SSS02403	7.5	16 J	<0.83	<4.2	<17	<0.83	<0.83	<8.3	<17	<42	<0.83	<0.83	<0.83	<8.3	<1.7	<0.83	1.2	<0.83	<8.3	<1.7	<1.7	<1.7	<0.83	<1.7
	SBL0582	SSS02515	10.0	31 J	<0.96	<4.8	<19	<0.96	<0.96	<9.6	<19	<48	<0.96	<0.96	<0.96	<9.6	<1.9	<0.96	4.9	<0.96	<9.6	<1.9	<1.9	<1.9	<0.96	<1.9
		SSS02532	5.0	12 J	1.3	<4.6	<18	<0.92	<0.92	<9.2	<18	<46	0.34 J	<0.92	<0.92	<9.2	<1.8	<0.92	<0.92	<0.92	<9.2	<1.8	<1.8	<1.8	<0.92	<1.8
		SSS02534	8.0	11 J	0.35 J	<4.2	<17	<0.84	<0.84	<8.4	<17	<42	<0.84	<0.84	<0.84	<8.4	<1.7	<0.84	<0.84	<0.84	<8.4	<1.7	<1.7	<1.7	<0.84	<1.7
		SSS02535	10.0	9.6 J	0.29 J	<4.2	<17	<0.83	<0.83	<8.3	<17	<42	<0.83	<0.83	<0.83	<8.3	<1.7	<0.83	<0.83	<0.83	<8.3	<1.7	<1.7	<1.7	<0.83	<1.7
	SBL0583	SSS02536	14.0	14 J	0.22 J	<5.0	<20	<1.0	<1.0	<10	<20	<50	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	<1.0	<2.0
		SSS02429	5.0	9.0 J	<0.79	<4.0	<16	<0.79	<0.79	<7.9	<16	<40	<0.79	<0.79	<0.79	<7.9	<1.6	<0.79	0.78 J	<0.79	<7.9	<1.6	<1.6	<1.6	<0.79	<1.6
		SSS02430	8.0	7.5 J	<0.76	<3.8	<15	<0.76	<0.76	<7.6	<15	<38	<0.76	<0.76	<0.76	<7.6	<1.5	<0.76	0.62 J	<0.76	<7.6	<1.5	<1.5	<1.5	<0.76	<1.5
		SSS02516	10.0	14 J	0.19 J	<4.7	<19	<0.95	<0.95	<9.5	<19	<47	<0.95	<0.95	<0.95	<9.5	<1.9	<0.95	1.3	<0.95	<9.5	<1.9	<1.9	<1.9	<0.95	<1.9
	SBL0584	SSS02399	4.5	7.9 J	2.3	<3.5	<14	<0.69	2.1	<6.9	<14	<35	19	<0.69	<0.69	<6.9	<1.4	<0.69	0.89	<0.69	<6.9	0.66 J	<1.4	<1.4	<0.69	<1.4
		SSS02400	7.5	42	0.42 J	<4.1	3.4 J	<0.81	2.0	<8.1	<16	<41	0.36 J	<0.81	<0.81	<8.1	<1.6	<0.81	0.33 J	<0.81	<8.1	<1.6	<1.6	<1.6	<0.81	<1.6
		SSS02401	7.5	33 J	0.41 J	<4.1	<16	<0.81	2.9	<8.1	<16	<41	0.32 J	<0.81	<0.81	<8.1	<1.6	<0.81	0.82	<0.81	<8.1	0.52 J	<1.6	<1.6	<0.81	<1.6
		SSS02517	10.0	64	0.29 J	<4.2	<17	0.41 J	<0.84	0.93 J	<17	<42	0.94	<0.84	<0.84	<8.4	<1.7	<0.84	<0.84	<0.84	<8.4	<1.7	<1.7	<1.7	<0.84	<1.7
	SBL0585	SSS02426	5.0	<1,600	64	<160	<650	1,100	910	<330	<650	<1,600	2,300	92	<33	8,200	120	330	10 J	240	<330	<65	70	25 J	150	250
		SSS02427	8.0	11 J	0.30 J	<4.0	<16	3.5	3.3 J	<8.1	<16	<40	5.3	<0.81	<0.81	93 J	0.48 J	0.93	0.78 J	<0.81	<8.1	<1.6	<1.6	<1.6	<0.81	0.58 J
		SSS02428	8.0	9.4 J	0.26 J	<3.8	<15	1.3	1.0	<7.5	<15	<38	1.8	<0.75	1.4	19	<1.5	<0.75	0.76	<0.75	<7.5	<1.5	4.6	<1.5	<0.75	0.29 J
		SSS02520	10.0	38 J	0.25 J	<4.2	6.8 J	<0.84	<0.84	<8.4	<17	<42	<0.84	<0.84	<0.84	<8.4	<1.7	<0.84	1.5	<0.84	<8.4	<1.7	<1.7	<1.7	<0.84	<1.7
		SSS02521	15.0	18 J	0.28 J	<4.3	<17	<0.87	<0.87	<8.7	<17	<43	<0.87	<0.87	<0.87	<8.7	<1.7	<0.87	0.28 J	<0.87	<8.7	<1.7	<1.7	<1.7	<0.87	<1.7
	SBL0586	SSS02453	5.0	9.0 J	0.21 J	<3.7	<15	<0.75	<0.75	<7.5	<15	<37	0.13 J	<0.75	<0.75	<7.5	<1.5	<0.75	<0.75	<0.75	<7.5	<1.5	<1.5	<1.5	<0.75	<1.5
		SSS02454	8.0	17 J	0.31 J	<4.1	<16	<0.82	<0.82	<8.2	<16	<41	0.16 J	<0.82	<0.82	<8.2	<1.6	<0.82	<0.82	<0.82	<8.2	<1.6	<1.6	<1.6	<0.82	<1.6
		SSS02544	10.0	15 J	0.46 J	<5.4	<21	<1.1	<1.1	<11	<21	<54	<1.1	<1.1	<1.1	<11	<2.1	<1.1	<1.1	<1.1	<11	<2.1	<2.1	<2.1	<1.1	<2.1
	SBL0587	SSS02460	5.0	19 J	<0.72	<3.6	<14	<0.72	<0.72	<7.2	<14	<36	<0.72	<0.72	<0.72	<7.2	<1.4	<0.72	0.48 J	<0.72	<7.2	<1.4	<1.4	<1.4	<0.72	<1.4
		SSS02480	8.0	18 J	0.20 J	<3.9	<15	<0.77	<0.77	<7.7	<15	<39	<0.77	<0.77	<0.77	<7.7	<1.5	<0.77	0.51 J							

TABLE 1 PROPERTY 23 SHALLOW SOIL VOC DATA Pre-design Investigation Soil and NAPL Operable Unit Del Amo Superfund Site																										
Area	Boring	Sample	Depth (ft bgs)	Detected VOC Concentrations (µg/kg)																						
				Acetone	Benzene	Bromoform	2-Butanone (MEK)	n-Butylbenzene	sec-Butylbenzene	Carbon Disulfide	Chloromethane	Cyclohexane	Ethylbenzene	Isopropylbenzene (Cumene)	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	Styrene	PCE	Toluene	1,1,2-Trichloro- 1,2,2-trifluoroethane (Freon 113)	TCE	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	o-Xylene	p/m-Xylene
Northeast	SBL0605	SSS02370	2.5	<21,000	75 J	<2,100	<8,500	<420	<420	<4,200	<8,500	<21,000	68,000	<420	<420	<4,200	<850	<420	<420	<420	<180 Uz	<850	<850	<850	<420	<850
		SSS02371	5.5	<100,000	<2,100	<10,000	<41,000	<2,100	<2,100	<21,000	<41,000	<100,000	190,000	<2,100	<2,100	<21,000	<4,100	<2,100	<2,100	1,700 J	<890 Uz	<4,100	<4,100	<4,100	<2,100	<4,100
		SSS02372	7.5	<1,100,000	2,900 J	<110,000	<430,000	<22,000	<22,000	<220,000	<430,000	<1,100,000	2,500,000	<22,000	<22,000	<220,000	<43,000	<22,000	<22,000	37,000	<9,800 Uz	<43,000	<43,000	<43,000	<22,000	<43,000
		SSS02505	9.4	<200,000	<3,900	<20,000	<79,000	<3,900	<3,900	<39,000	<79,000	<200,000	1,400,000	<3,900	<3,900	<39,000	<7,900	<3,900	<3,900	18,000	<39,000	<7,900	<7,900	<7,900	<3,900	<7,900
East	SBL0591	SSS02424	4.5	<2,000	750	<200	<810	39 J	39 J	24 J	<14 Uz	<2,000	370	<41	<41	<410	<81	<41	<41	<41	<410	<81	<81	<81	<41	<81
		SSS02425	7.5	<2,000	6,200	<200	<800	46	47	<400	<800	<2,000	3,500	<40	<40	<400	<80	<40	<40	<40	<400	<80	<80	<80	<40	<80
		SSS02475	10.5	<2,000	8,900	<200	<800	21 J	28 J	<400	<800	<2,000	3,900	<40	<40	<400	<80	<40	<40	51	<400	<80	<80	<80	<40	<80
		SSS02476	14.0	<2,000	4,400	<200	<800	78	97	<400	<800	<2,000	3,500	27 J	<40	<400	<80	<40	<40	37 J	<400	<80	<80	<80	<40	<80
	SBL0592	SSS02416	4.5	<18,000	54,000	<1,800	<7,400	58,000	35,000	<3,700	<7,400	<18,000	140,000	2,100	<370	300 J	1,300	<370	<370	740	<3,700	<740	<740	<740	<370	<740
		SSS02423	7.5	940 J	170,000	<700	<2,800	61,000	56,000	<1,400	<2,800	1,900 J	720,000	4,800	<140	140 J	4,600	120 J	<140	3,200	<1,400	<280	<280	<280	170	120 J
		SSS02477	9.5	<190,000	99,000	<19,000	<78,000	22,000	31,000	<39,000	<78,000	<190,000	530,000	2,900 J	<3,900	<39,000	2,700 J	<3,900	<3,900	2,100 J	<2,000 Uz	<7,800	<7,800	<7,800	<3,900	<7,800
		SSS02478	15.0	<770,000	460,000	<77,000	<310,000	58,000	81,000	<150,000	<310,000	<770,000	2,300,000	9,100 J	<15,000	<150,000	8,700 J	<15,000	<15,000	11,000 J	<7,700 Uz	<31,000	<31,000	<31,000	<15,000	<31,000
	SBL0593	SSS02378	4.5	16 J	0.56 J	<3.8	<15	<0.76	3.6	1.5 J	<15	<38	90	1.2	<0.76	<7.6	<1.5	<0.76	<0.19 Uz	<0.76	<7.6	<1.5	<1.5	<1.5	<0.76	<1.5
		SSS02396	7.5	11 J	0.14 J	<4.1	<17	<0.83	2.3	<8.3	<17	<41	1.7	0.75 J	<0.83	<8.3	<1.7	<0.83	<0.83	<0.83	<8.3	<1.7	<1.7	<1.7	<0.83	<1.7
		SSS02390	11.7	10 J	11	<3.6	<14	3.1	6.6	<7.1	<14	<36	97	1.5	<0.71	<7.1	0.74 J	<0.71	<0.20 Uz	<0.71	<7.1	<1.4	<1.4	<1.4	<0.71	<1.4
		SSS02391	15.0	53	0.69 J	<3.8	4.0 J	<0.77	0.59 J	0.42 J	<15	<38	3.5	<0.77	<0.77	<7.7	<1.5	<0.77	<0.21 Uz	<0.77	<7.7	<1.5	<1.5	<1.5	<0.77	<1.5
	SBL0594	SSS02373	4.5	<12,000	11,000	<1,200	<4,900	200 J	260	<2,400	<4,900	<12,000	29,000	<240	<240	<2,400	<490	<240	<240	130 J	<2,400	<490	<490	<490	<240	<490
		SSS02369	7.5	<120,000	130,000	<12,000	<47,000	26,000	33,000	<23,000	<47,000	<120,000	2,100,000	9,200	<2,300	<23,000	6,500	11,000	<2,300	14,000	<1,000 Uz	<4,700	<4,700	<4,700	<2,300	<4,700
		SSS02437	13.0	<170,000	270,000	<17,000	<70,000	43,000	70,000	<35,000	<70,000	<170,000	2,300,000	24,000	<35,000	<35,000	20,000	21,000	<35,000	33,000	<35,000	<7,000	<7,000	<7,000	<3,500	<7,000
		SSS02436	14.0	<82,000	240,000	<8,200	<33,000	53,000	75,000	<16,000	<33,000	<82,000	5,400,000	29,000	<1,600	<16,000	24,000	24,000	<1,600	37,000	<16,000	<3,300	<3,300	<3,300	<1,600	2,000 J
	SBL0595	SSS02376	4.5	<4,300	3,600	<430	<1,700	<85	64 J	<850	<1,700	<4,300	3,800	71 J	<85	<850	<170	<85	<85	<85	<850	<170	<170	<170	<85	<170
		SSS02377	7.5	<46,000	49,000	<4,600	<18,000	9,200	11,000	<9,100	<18,000	<46,000	440,000	14,000	<910	<9,100	4,900	1,000	<910	2,800	<9,100	<1,800	<1,800	<1,800	<910	<1,800
		SSS02410	11.0	<220,000	44,000	<22,000	<89,000	14,000	18,000	<44,000	<89,000	<220,000	460,000	15,000	<4,400	<44,000	7,000 J	<4,400	<4,400	3,500 J	<44,000	<8,900	<8,900	<8,900	<4,400	<8,900
		SSS02411	15.0	<210,000	140,000	<21,000	<83,000	81,000	100,000	<41,000	<83,000	<210,000	2,200,000	74,000	<4,100	<41,000	34,000	2,600 J	<4,100	16,000	1,600 J	<8,300	<8,300	<8,300	<4,100	<8,300
	SBL0596	SSS02374	4.5	<7,300	16,000	<730	<2,900	590	390	<1,500	<2,900	<7,300	80,000	110 J	<150	<1,500	<290	<150	<150	84 J	<1,500	<290	<290	<290	<150	<290
		SSS02375	7.5	<130,000	100,000	<13,000	<52,000	27,000	31,000	<26,000	<52,000	<130,000	1,800,000	3,000	<2,600	<26,000	2,300 J	<2,600	<2,600	2,400 J	<1,000 Uz	<5,200	<5,200	<5,200	<2,600	<5,200
		SSS02380	10.0	<900,000	190,000	<90,000	<360,000	48,000	55,000	<180,000	<360,000	<900,000	2,100,000	<18,000	<18,000	<360,000	<36,000	<18,000	<18,000	<18,000	<7,200 Uz	<36,000	<36,000	<36,000	<18,000	<36,000
		SSS02381	12.5	<420,000	110,000	<42,000	<170,000	43,000	57,000	<85,000	<170,000	<420,000	1,500,000	<8,500	<8,500	<85,000	4,500 J	<8,500	<8,500	<8,500	<4,000 Uz	<17,000	<17,000	<17,000	<8,500	<17,000
	SBL0598	SSS02404	4.5	<34,000	35,000	<3,400	<14,000	30,000	39,000	<6,800	<14,000	<34,000	590,000	3,200	<680	<6,800	2,700	<680	<680	1,900	<6,800	<1,400	<1,400	<1,400	<680	<1,400
		SSS02405	7.5	<88,000	35,000	<8,800	<35,000	34,000	51,000	<18,000	<35,000	<88,000	830,000	4,400	<1,800	<18,000	3,900	<1,800	<1,800	3,700	<18,000	<3,500	<3,500	<3,500	<1,800	<3,500
Southwest	SBL0603	SSS02546	5.0	5.3 J	<0.18 Uz	<3.8	<15	<0.76	<0.76	<7.6	<15	<38	<0.76	<0.76	<7.6	<1.5	<0.76	4.5	<0.76	<7.6	<1.5	<1.5	<1.5	<0.76	<1.5	
		SSS02553	8.0	9.9 J	<0.28 Uz	<4.3	<17	<0.85	<0.85	<8.5	<17	<43	<0.85	<0.85	<8.5	<1.7	<0.85</									

TABLE 2
PROPERTY 23 SHALLOW SOIL PHYSICAL PROPERTIES
Pre-design Investigation
Soil and NAPL Operable Unit
Del Amo Superfund Site

Area	Soil Boring	Depth (ft. bgs)	Sample Number	Moisture Content (% wt)	Total Porosity (%Vb)	Air Permeability		Grain Size Distribution (% wt)						
						Horizontal (md)	Vertical (md)	Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Silt & Clay
East	SBL0594	12.0	SSS02434	12.6	37.7	2.89	4.08	0.00	0.00	0.00	24.59	56.02	19.39	75.41
		14.0	SSS02435	14.1	38.0	78.2	32.5	0.00	0.00	0.16	21.86	66.53	11.44	77.98
	SBL0596	8.0	SSS02379	14.8	36.1	15.1	68.7	0.00	0.00	0.72	25.30	43.36	30.63	73.98
		13.0	SSS02382	12.2	42.3	167	93.3	0.00	0.00	2.54	24.88	53.48	19.10	72.58
Northeast	SBL0605	9.4	SSS02507	14.3	35	0.73	0.49	0.00	0.00	0.00	14.49	49.17	36.34	85.51
		14.0	SSS02506	12.1	36.5	11.3	56.7	0.00	0.00	0.96	27.93	59.33	11.79	71.11

Notes

ft. bgs = feet below ground surface

% wt = % weight

Vb = bulk volume

md = millidarcy

TABLE 1
DEEP SOIL PHYSICAL PROPERTIES AT SOURCE AREA 6
PRE-DESIGN INVESTIGATION
SOIL AND NAPL OPERABLE UNIT
DEL AMO SUPERFUND SITE

Soil Boring	Depth	Sample Number	Moisture Content (% wt)	Total Porosity (%Vb)	Vertical Air permeability (md)	Horizontal Air Permeability (md)	Grain Size Distribution (Wt %)					
							Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay
SBL0594	21.3	SSS02440	32.5	49.5	1.86	71.2	0.00	0.00	0.00	1.06	39.50	59.43
	29.0	SSS02443	7.7	44.2	10600	8340	0.00	0.00	11.08	74.02	10.26	4.64
	38.0	SSS02445	17.5	41.4	426	1.71	0.00	0.00	0.82	35.18	49.61	14.39
SBL0596	23.0	SSS02384	28.0	45.8	6.28	1.49	0.00	0.00	0.00	2.43	46.69	50.88
	33.0	SSS02387	23.0	43.5	2.22	1.68	0.00	0.00	0.51	12.99	68.42	18.09
	39.0	SSS02389	19.6	42.9	40.1	11.3	0.00	0.00	1.00	34.99	44.72	19.29

Notes

ft. bgs = feet below ground surface

% wt = % weight

Vb = bulk volume

md = millidarcy

TABLE 2
DEEP SOIL VOC CONCENTRATIONS AT SOURCE AREA 6
PRE-DESIGN INVESTIGATION
DEL AMO SUPERFUND SITE

Boring	Sample	Depth (ft bgs)	Detected VOC Concentrations (µg/kg)														Total VOCs
			Acetone	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Ethylbenzene	Isopropylbenzene (Cumene)	n-Propylbenzene	Styrene	PCE	Toluene	1,1,2-Trichloro- 1,2,2-trifluoroethane (Freon 113)	o-Xylene	p/m-Xylene	
SBL0593	SSS02392	22.5	<2,100	4,200	<41	50	<820	2,400	28 J	<82	<41	<12 Uz	<41	<410	<41	<82	6,700
	SSS02407	29.5	<2,200	1,200	<43	31 J	<860	870	<43	<86	<43	<9.0 Uz	<43	<430	<43	<86	2,100
	SSS02408	36.0	<7,400	12,000	<150	<150	<3,000	7,800	<150	<300	<150	<150	88 J	56 J	<150	<300	20,000
	SSS02409	39.0	<8,100	15,000	<160	<160	<3,200	8,900	<160	<320	<160	<160	110 J	<1,600	<160	<320	24,000
	SSS02393	42.0	<7,800	15,000	<160	<160	<3,100	8,400	<160	<310	<160	<160	110 J	<1,600	<160	<310	24,000
	SSS02394	44.0	<7,900	22,000	<160	93 J	<3,200	10,000	<160	<320	<160	<160	150 J	<1,600	<160	<320	32,000
SBL0594	SSS02438	17.0	<71,000	460,000	67,000	93,000	<29,000	6,500,000	39,000	33,000	10,000	<1,400	53,000	<14,000	990 J	2,500 J	7,300,000
	SSS02441	24.0	<390,000	660,000	130,000	200,000	<150,000	6,200,000	66,000	65,000	<7,700	<7,700	42,000	<77,000	<7,700	<15,000	7,400,000
	SSS02442	25.0	<200,000	410,000	120,000	180,000	<78,000	4,200,000	52,000	52,000	5,600	<3,900	23,000	<39,000	<3,900	<7,800	5,000,000
	SSS02444	33.0	<41,000	4,600	16,000	17,000	<16,000	130,000 JI	3,300	3,600	<810	<810	<810	<8,100	<810	<1,600	170,000
	SSS02446	37.5	<66,000	500,000	88,000	110,000	<26,000	2,800,000	37,000	37,000	<1,300	<1,300	11,000	<13,000	<1,300	570 J	3,600,000
SBL0595	SSS02412	21.0	<86,000	72,000	1,300 J	1,800	<34,000	130,000	2,100	<3,400	<1,700	<1,700	2,300	<17,000	<1,700	<3,400	210,000
	SSS02413	26.5	53,000 J	760,000	200,000	280,000	<170,000	4,100,000	93,000	75,000	<8,400	<8,400	35,000	<84,000	<8,400	<17,000	5,600,000
	SSS02414	33.2	<190,000	150,000	44,000	58,000	<77,000	1,300,000	18,000	13,000	<3,800	<3,800	5,900	<38,000	<3,800	<7,700	1,600,000
	SSS02415	37.0	<18,000	28,000	1,700	1,900	<7,100	43,000	580	450 J	<360	<360	450	<3,600	<360	<710	76,000
	SSS02431	42.0	<11,000	25,000	42 J	<230	<4,500	11,000	<230	<450	<230	<230	210 J	<2,300	<230	<450	36,000
SBL0596	SSS02383	19.0	<39,000	15,000	5,100	6,100	<15,000	140,000 JI	440 J	440 J	<770	<770	<770	<7,700	<770	<1,500	170,000
	SSS02386	30.0	280 J	3,400	57	77	<760	3,300	<38	<76	<38	<38	21 J	17 J	<38	<76	7,200
	SSS02388	35.0	<37,000	100,000	<740	16,000	<15,000	410,000	1,900	1,500	<740	<190 Uz	1,800	<7,400	<740	<1,500	530,000
	SSS02395	42.5	<19,000	35,000	<390	<390	<7,700	13,000	<390	<770	<390	<390	<390	<3,900	<390	<770	48,000
SBL0597	SSS02469	17.5	6.7 J	69	2.7	4.7	<17	510	1.2	0.64 J	<0.87	<0.87	0.91	<8.7	<0.87	<1.7	600
	SSS02470	23.5	<2,100	3,800	63	77	<830	7,200	23 J	<83	<41	<41	31 J	<410	<41	<83	11,000
	SSS02471	28.0	<4,100	5,200	56 J	66 J	<1,600	7,600	<81	<160	<81	<81	56 J	<810	<81	<160	13,000
	SSS02472	34.8	<4,100	10,000	53 J	77 J	<1,700	11,000	<83	<170	<83	<83	110	<830	<83	<170	21,000
	SSS02473	38.0	<9,700	26,000	85 J	130 J	<3,900	16,000	<190	<390	<190	<190	160 J	<1,900	<190	<390	42,000
	SSS02474	41.5	<2,700	2,400	55	71	<1,100	3,200	<54	<110	<54	<54	<54	<540	<54	<110	5,700
SBL0598	SSS02447	18.5	<380,000	54,000	32,000	43,000	<150,000	1,100,000	4,500 J	<15,000	<7,600	<7,600	6,100 J	<76,000	<7,600	<15,000	1,200,000
	SSS02448	22.5	<120,000	20,000	8,100	11,000	<47,000	290,000	<2,400	<4,700	<2,400	<2,400	1,600 J	<24,000	<2,400	<4,700	330,000
	SSS02449	28.0	<1,100,000	76,000	87,000	130,000	<460,000	2,800,000	<23,000	<46,000	<23,000	<23,000	12,000 J	<230,000	<23,000	<46,000	3,100,000
	SSS02450	32.0	<48,000	5,600	6,700	9,400	<19,000	140,000	760 J	800 J	<950	<950	540 J	<9,500	<950	<1,900	160,000
	SSS02465	34.0	<120,000	9,100	20,000	29,000	<48,000	380,000	2,200 J	2,600 J	<2,400	<2,400	1,300 J	<24,000	<2,400	<4,800	440,000
	SSS02466	40.0	<97,000	47,000	7,900	11,000	<39,000	290,000	<1,900	<3,900	<1,900	<1,900	1,800 J	<19,000	<1,900	<3,900	360,000
	SSS02467	43.0	<17,000	37,000	400	520	<6,900	28,000	<340	<690	<340	<340	340 J	<3,400	<340	<690	66,000
SBL0599	SSS02479	19.0	<38	0.25 J	<0.77	<0.77	<15	0.28 J	0.28 J	<1.5	<0.77	<0.77	<0.77	<0.35 Uz	<0.77	<1.5	1
	SSS02495	28.0	12 J	970	1.2	2.3	<21	190	2.2	1.0 J	<1.1	<1.1	<1.1	0.47 J	<1.1	<2.1	1
	SSS02491	33.5	41 J	33	1.0	1.5	<20	52	0.69 J	<2.0	<0.98	<0.98	<0.98	0.44 J	<0.98	<2.0	1,300
	SSS02493	39.0	<3,700	10,000	<74	69 J	40 J	7,000	63 J	37 J	<74	<74	<74	<740	<74	<150	17,000
	SSS02494	41.0	<9,800	23,000	93 J	150 J	<3,900	12,000	<200	<390	<200	<200	<200	<2,000	<200	<390	35,000

TABLE 2
DEEP SOIL VOC CONCENTRATIONS AT SOURCE AREA 6
PRE-DESIGN INVESTIGATION
DEL AMO SUPERFUND SITE

Boring	Sample	Depth (ft bgs)	Detected VOC Concentrations (µg/kg)														Total VOCs
			Acetone	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Ethylbenzene	Isopropylbenzene (Cumene)	n-Propylbenzene	Styrene	PCE	Toluene	1,1,2-Trichloro- 1,2,2-trifluoroethane (Freon 113)	o-Xylene	p/m-Xylene	
SBL0600	SSS02564	19.0	<43	<0.20 Uz	<0.86	<0.86	<17	<0.86	<0.86	<1.7	<0.86	<0.86	<0.86	<8.6	<0.86	<1.7	0.20
	SSS02565	23.0	5.9 J	<0.19 Uz	<0.84	<0.84	<17	<0.84	<0.84	<1.7	<0.84	<0.84	<0.84	<8.4	<0.84	<1.7	6.1
	SSS02566	28.0	<42	<0.30 Uz	<0.84	<0.84	<17	<0.84	<0.84	<1.7	<0.84	<0.84	<0.84	<8.4	<0.84	<1.7	0.30
	SSS02567	30.5	9.6 J	66 Jf	<0.86	<0.86	<17	<0.86	<0.86	<1.7	<0.86	<0.86	<0.86	<8.6	<0.86	<1.7	76
	SSS02569	39.0	<1,900	1,800	<37	<37	<750	<37	<37	<75	<37	<37	<37	<370	<37	<75	1,800
	SSS02570	42.5	<2,200	1,300	<43	<43	<860	<43	<43	<86	<43	<43	<43	<430	<43	<86	1,300
SBL0601	SSS02501	17.5	<9,300	7,500	240	360	<3,700	16,000	180 J	180 J	<190	<190	140 J	<1,900	<190	<370	25,000
	SSS02489	21.5	<3,900	9,800	150	240	<1,500	15,000	120	190	<77	<77	110	<770	<77	<150	26,000
	SSS02490	29.5	<2,500	640	470	480	<980	3,800	90	100	<49	<49	<49	<490	<49	<98	5,600
	SSS02502	32.0	<24,000	3,600	10,000	14,000	<9,500	110,000	3,600	3,800	<480	<480	<480	<4,800	<480	<950	150,000
	SSS02503	39.0	<3,900	14,000	220	310	<1,600	15,000	180	250	<78	<78	<78	<780	<78	<160	30,000
	SSS02504	42.5	<9,500	21,000	1,200	1,800	<3,800	29,000	630	670	<190	<190	<190	<1,900	<190	<380	54,000
SBL0602	SSS02496	19.0	<200,000	38,000	13,000	17,000	<79,000	390,000	6,000	3,900 J	<3,900	<3,900	4,900	1,900 J	<3,900	<7,900	470,000
	SSS02497	25.5	<190,000	58,000	30,000	35,000	<77,000	510,000	9,100	6,900 J	<3,800	<3,800	3,800 J	<38,000	<3,800	<7,700	650,000
	SSS02498	33.5	<96,000	39,000	11,000	13,000	<38,000	210,000	3,600	2,600 J	<1,900	<1,900	1,400 J	<19,000	<1,900	<3,800	280,000
	SSS02499	39.0	<7,200	17,000	120 J	140 J	<2,900	12,000	92 J	<290	<140	43 J	250	<1,400	<140	<290	30,000
	SSS02500	41.0	<9,800	24,000	<200	<200	<3,900	14,000	<200	<390	<200	<200	260	<2,000	<200	<390	38,000

Notes:

ft bgs	feet below ground surface	J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
VOC	volatile organic compound	f	Field duplicate imprecision.
µg/kg	micrograms per kilogram	l	Laboratory control sample recovery failure.
RSL	Regional Screening Level	U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
PCE	Tetrachloroethene	z	Method blank contamination.
TCE	Trichloroethene		

Eurofins/Calscience Reports:

17-04-1898
17-04-1973
17-04-2107
17-04-2216
17-04-2255
17-05-0081
17-05-0231

ATTACHMENT 10

VOC Mass Removal Rates – Shallow and Deep Zone

ATTACHMENT 10
VOC MASS REMOVAL RATES – Shallow and Deep Zone
Soil Vapor Extraction Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

Benzene and Ethylbenzene Mass Removal Rates

Influent Sample	Sample ID	Sample Date	Time	Benzene (ppmv)	Ethylbenzene (ppmv)	Average Flow Rate (scfm)	Benzene Rate (lbs/hr)	Ethylbenzene Rate (lbs/hr)	Total VOC Rate (Benzene + Ethylbenzene) (lbs/hr)
Molecular Weight (g/mol)				78.1	106.16				
Shallow Zone									
Shallow Constant Rate Test; Initial	VSS01363	04/03/18	915	330	83	100.7	0.41	0.14	0.55
Shallow Constant Rate Test; Midpoint	VSS01366	04/05/18	1200	980	670	100.7	1.22	1.13	2.35
Shallow Constant Rate Test; Final	VSS01369	04/06/18	1500	660	320	100.7	0.82	0.54	1.36
Average				657	358	100.7	0.82	0.61	1.42
Deep Zone									
Deep Constant Rate Test; Midpoint Hour 32.75	VSS01385	04/11/18	1025	3,900	3,200	116.7	5.63	6.28	11.90
Deep Constant Rate Test; Midpoint Hour 56.3	VSS01388	04/12/18	1000	4,100	3,400	116.7	5.92	6.67	12.58
Deep Constant Rate Test; Final Hour 82	VSS01392	04/13/18	1156	2,600	1,300	116.7	3.75	2.55	6.30
Average				3,533	2,633	116.7	5.10	5.16	10.26

Notes:

ppmv = parts per million by volume

scfm = standard cubic feet per minute

lbs/hr = pounds per hour

Following formula used to calculate rates:

$$\frac{(ppmv)(10^{-6})(scfm)(60 \frac{min}{hr})(molecular\ weight \frac{lbs}{mole})}{379 \frac{scf}{mole}} = \left(\frac{lbs}{hr} \right)$$

FIGURE 10-1
MASS REMOVAL RATES
Shallow Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

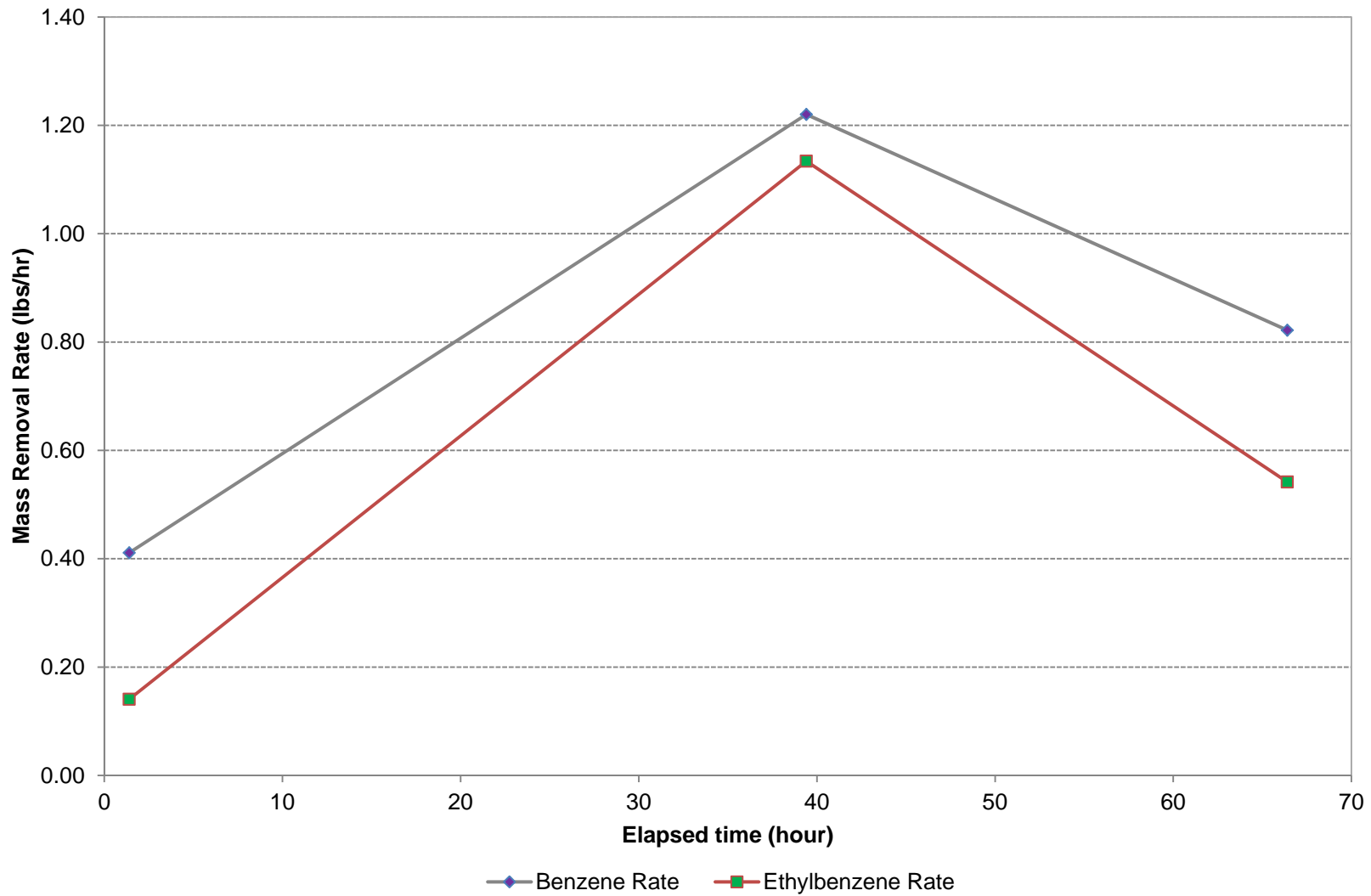


FIGURE 10-2
MASS REMOVAL RATES
Deep Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

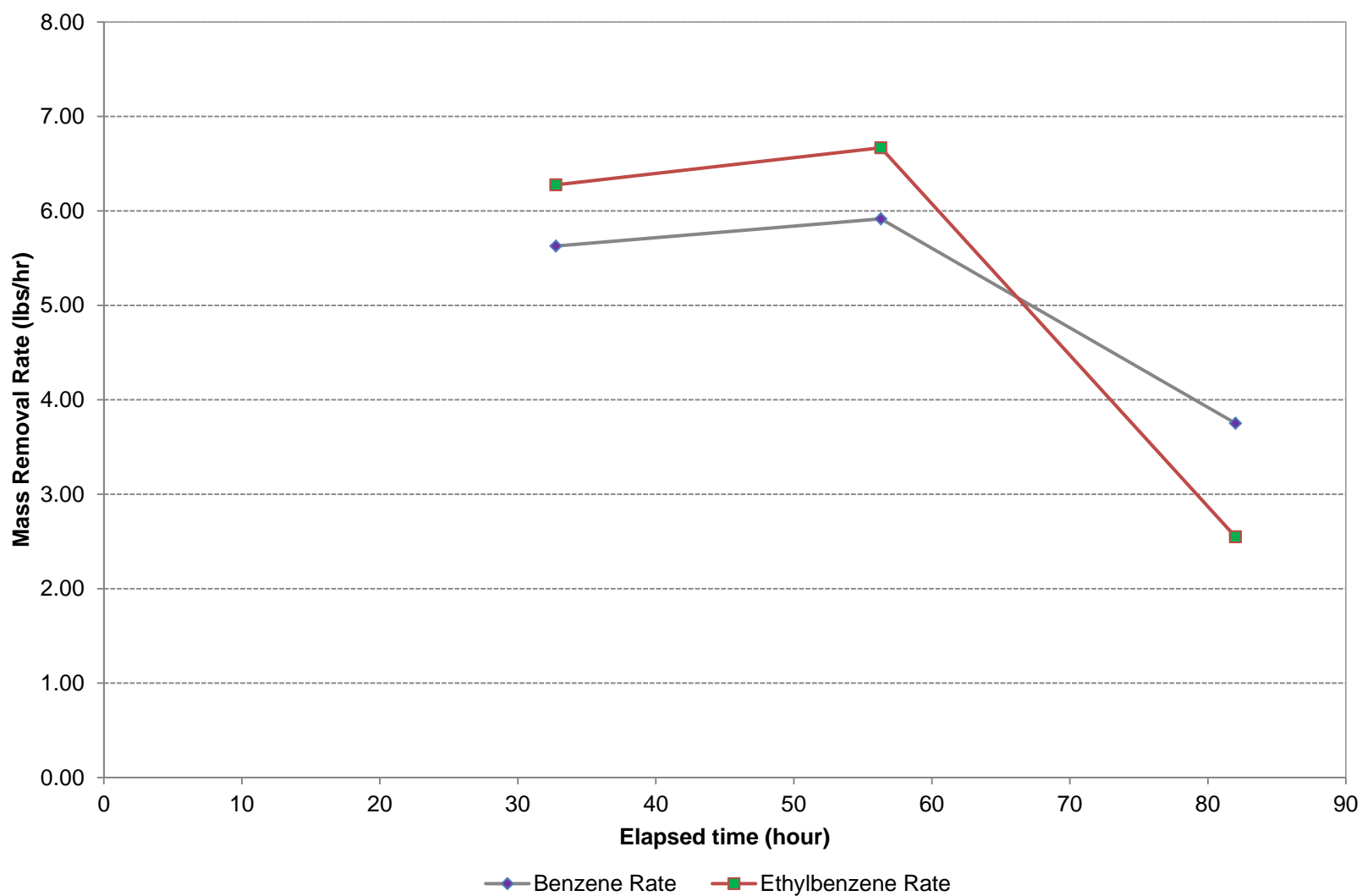


FIGURE 10-3
CO2 AND O2 ANALYTICAL CONCENTRATIONS
Shallow Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)

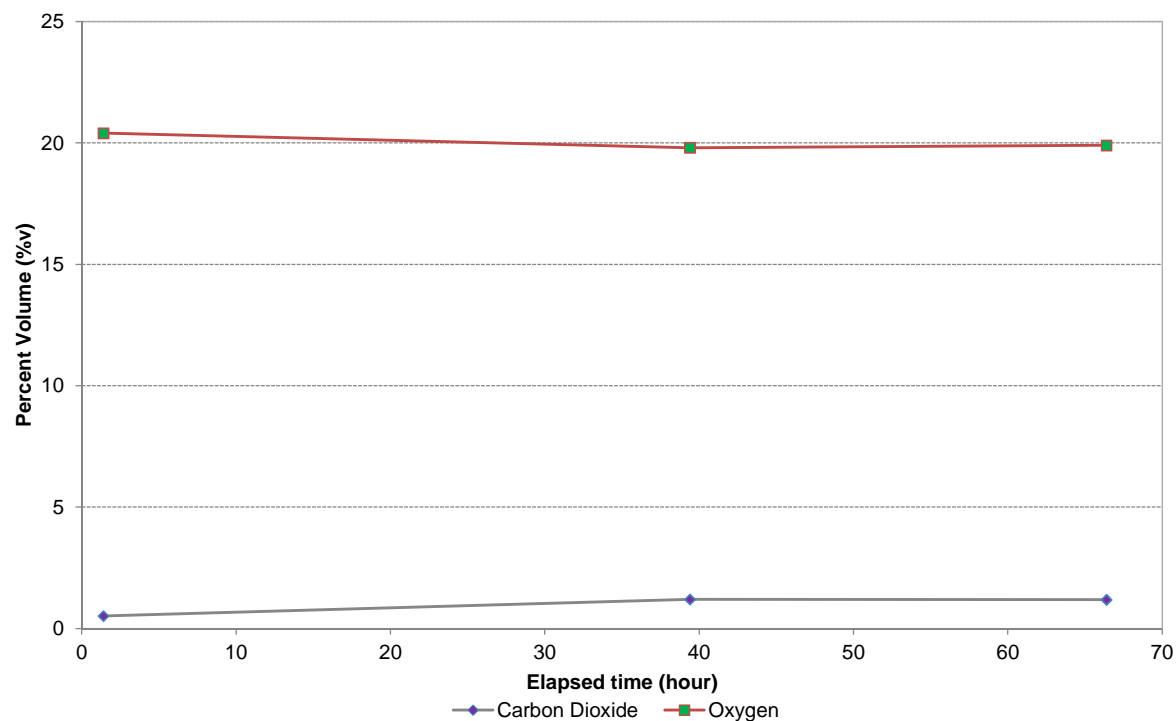
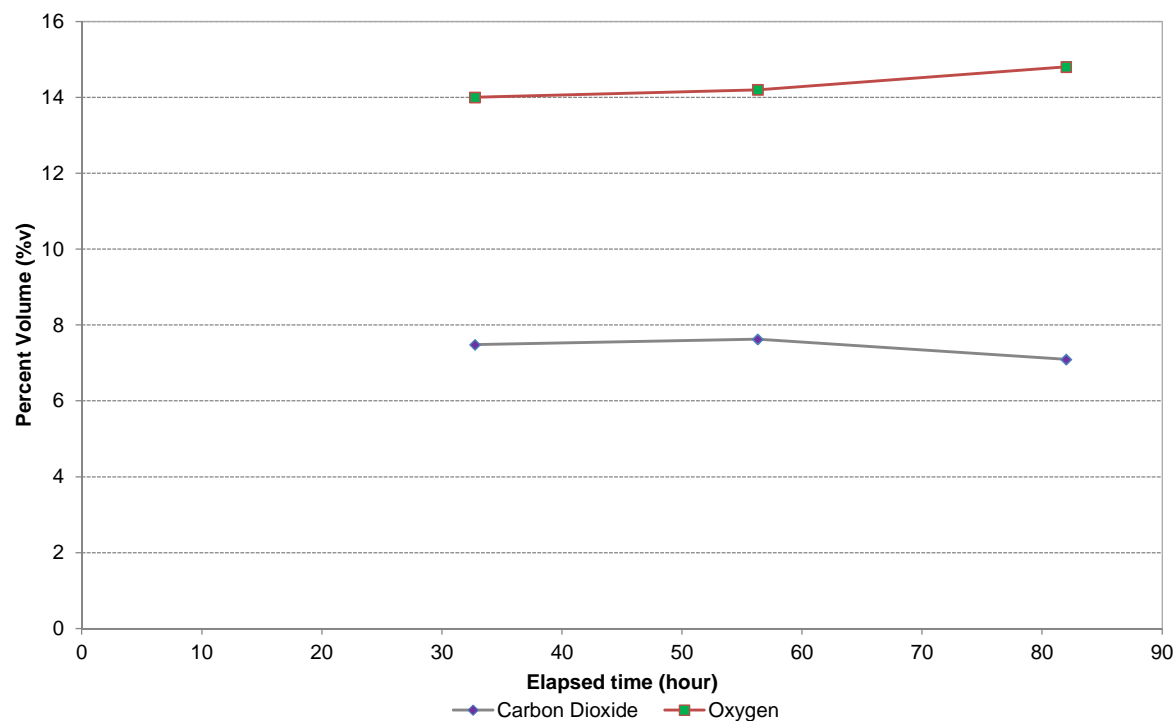


FIGURE 10-4
CO2 AND O2 ANALYTICAL CONCENTRATIONS
Deep Zone Constant Rate Testing; SVE Pilot Test Report
Del Amo Superfund Site Soil & NAPL Operable Unit (OU-1)



ATTACHMENT 11

HRA Spreadsheets and Input Data

Site: Property 23/SA-6 (Del Amo), 19875 Pacific Gateway Dr., Torrance, California 90502.

Table 1. D/F only HRA ¹	HRA Results							
	Tier I		Tier 2					
	Cancer/ chronic ASI	Acute ACI	Cancer Residential ²	Cancer Worker ²	Cancer Burden	Acute	chronic	8 hour Chronic
SCAQMD Limit:	1.0	1.0	1.0E-06	1.0E-06	0.5	1.0	1.0	1.0
Scenario 1, Case 1 ³	1.24	0.00	2.33E-08	5.81E-09	N/A	0.00	0.00	0.00
Scenario 1, Case 2 ⁴	3.14	0.00	5.89E-08	1.51E-08	N/A	0.00	0.00	0.00

Table 2. D/F and TACs HRA ¹	HRA Results													
	Tier I		Tier 2						Tier 3					
	Cancer/ chronic ASI	Acute ACI	Cancer Residential ²	Cancer Worker ²	Cancer Burden	Acute	chronic	8 hour Chronic	Cancer Residential ²	Cancer Worker ²	Cancer Burden	Acute	chronic	8 hour Chronic
SCAQMD Limit:	1.0	1.0	1.0E-06	1.0E-06	0.5	1.0	1.0	1.0	1.0E-06	1.0E-06	0.5	1.0	1.0	1.0
Scenario 2, Case 1 ⁵	474.80	5.68	5.92E-06	6.59E-06	0.10	0.82	1.58	1.58	5.37E-07	2.46E-07	N/A	0.07	0.06	0.06
Scenario 2, Case 2 ⁶	841.98	10.07	1.05E-05	1.17E-05	0.28	1.45	2.80	2.80	9.51E-07	4.37E-07	N/A	0.12	0.10	0.10

Notes:

N/A = Cancer Burden calculation "Not Applicable" if residential and worker cancer risk below one in a million.

1. See Image 1 for HRA Tier 1 and Tier 2 Input Data. See image 2 for additional Teir 3 Input Data.

2. A thermal oxidizer is considered T-BACT for VOC and TACs which raises the HRA allowable limit from 1.0E-06 to 10.0E-06. However for purposes of alleviating residential concerns, a limit of 1.0E-06 (no TBACT) is used in this evaluation for conservatism.

3. D/F emissions based on worst-case of blended concentrations from exhaust samples and includes shallow wells run 2 (150 dscf) and deep wells run 1 (350 dscf).

4. D/F emissions based on worst-case single test run including shallow wells run 2 (at 500 dscf).

5. D/F emissions based on Scenario 1, Case 1. TACs based on blended Shallow [150 scfm x worst-case concentrations from shallow test (B = 1.3, EB = 2.2, T = 0.033 ppmv (April 5 data))] and Deep [350 scfm x representative concentrations from deep test (B = 19, EB = 39, T = 0.5 ppmv (April 13 data))].

6. D/F emissions based on Scenario 1, Case 1. TACs based on 25 ppmv Benzene and 50 ppmv Ethylbenzene total exhaust concentrations.

Color Key:

Red - Not Passing

Green - Passing (no TBACT, i.e.

1 in a million limit)

Image 1. Tier 1, 2, 3 HRA Input Data

1. Stack Data	Input	Units
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Control Efficiency	0.000	
Does source have T-BACT?	NO	<input type="text"/>
Source type (Point or Volume)	P	P or V
Stack Height or Building Height	20	feet
Building Area	5000	ft ²
Distance-Residential	400	meters
Distance-Commercial	50	meters
Meteorological Station	Hawthorne Airport	
Project Duration (Short term options: 2, 5, or 9 years; Else 30 years)	5	years

Image 2. Additional Teir 3 HRA Input Data

SCREEN INPUT DATA - BRITISH UNITS

Temperature	1550.00	°F
Stack diameter	18.00	in
Stack height	20.00	ft
Actual exhaust rate	500.00	acfm
Modeling emissions rate	0.04	lb/hr



0 1,000 2,000
Scale in Feet

Source: AirPhotoUSA dated February 2006

Possible location of full-scale SVE system is more than 50 meters away from nearest commercial receptors and approximately 400 meters from nearest residential receptor

FIGURE 1

SITE LOCATION MAP

SVE Pilot Test Report
Soil and NAPL Operable Unit - OU1
Del Amo Superfund Site

AECOM

TIER 1/TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool VI.1

Application Deemed Complete Date	06/25/18
A/N	Scenario 1, Case 1
Facility Name	Del Amo Torrance

1. Stack Data	Input	Units
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Control Efficiency	0.000	
Does source have T-BACT?	NO	
Source type (Point or Volume)	P	P or V
Stack Height or Building Height	20	feet
Building Area	5000	ft ²
Distance-Residential	400	meters
Distance-Commercial	50	meters
Meteorological Station	Hawthorne Airport	
Project Duration (Short term options: 2, 5, or 9 years; Else 30 years)	5	years

Conversion Units (select units)

From

1 feet

To

0.3048 meter

Source Type	Other
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO

FOR SOURCE TYPE OTHER THAN BOILER, CREMATORY, ICE, PRESSURE WASHER, OR SPRAY BOOTH, FILL IN THE USER DEFINED TABLE BELOW

Fac Name: Del Amo Torrance

A/N: Scenario 1, Case 1

TAC Code	Compound	Emission Rate (lbs/hr)	Molecular Weight	R1 - Uncontrolled (lbs/hr)	Efficiency Factor (Fraction range 0-1)	R2-Controlled (lbs/hr)
B1	Benzene		78.11		0.00000	
E3	Ethyl Benzene		106.16		0.00000	
C3	Carbon Disulfide		76.14		0.00000	
S6	Styrene		104.16		0.00000	
P2	Perchloroethylene (Tetrachloroethylene)		165.83		0.00000	
T3	Toluene		92.13		0.00000	
T8	Trichloroethylene		130.4		0.00000	
X3	o-Xylene		106.18		0.00000	
X4	p-Xylene		106.17		0.00000	
P22	Polychlorinated Dibenzo-p-Dioxins (PCDD)		459.7548		0.00000	
P23	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	9.63E-13	321.9744	9.63E-13	0.00000	9.62946E-13
P24	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.62E-12	356.4195	2.62E-12	0.00000	2.61994E-12
P25	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.64E-12	390.8646	1.64E-12	0.00000	1.6389E-12
P26	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	2.13E-12	390.8646	2.13E-12	0.00000	2.12771E-12
P27	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.93E-12	390.8646	1.93E-12	0.00000	1.93279E-12
P28	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	9.09E-12	425.3097	9.09E-12	0.00000	9.09066E-12
P29	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.74E-11	459.7548	1.74E-11	0.00000	1.74245E-11
P30	Polychlorinated Dibenzofurans (PCDF)		443.76		0.00000	
P31	2,3,7,8-Tetrachlorodibenzofuran	1.04E-11	305.97156	1.04E-11	0.00000	1.04361E-11
P32	1,2,3,7,8-Pentachlorodibenzofuran	1.12E-11	340.4201	1.12E-11	0.00000	1.11685E-11
P33	2,3,4,7,8-Pentachlorodibenzofuran	4.51E-12	340.4201	4.51E-12	0.00000	4.51081E-12
P34	1,2,3,4,7,8-Hexachlorodibenzofuran	8.86E-12	374.8652	8.86E-12	0.00000	8.85727E-12
P35	1,2,3,6,7,8-Hexachlorodibenzofuran	9.32E-12	374.8652	9.32E-12	0.00000	9.31726E-12
P37	2,3,4,6,7,8-Hexachlorodibenzofuran	6.40E-12	374.8652	6.40E-12	0.00000	6.39714E-12
P36	1,2,3,7,8,9-Hexachlorodibenzofuran	1.60E-12	374.8652	1.60E-12	0.00000	1.6012E-12
P38	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.86E-11	409.3103	1.86E-11	0.00000	1.85805E-11
P39	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.07E-12	409.3103	3.07E-12	0.00000	3.07462E-12
P40	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	8.20E-12	443.7554	8.20E-12	0.00000	8.1973E-12

TIER 1 SCREENING RISK ASSESSMENT REPORT

(Procedure Version 8.1 & Package N, September 1, 2017)

Application deemed complete date: 6/25/2018

A/N Scenario 1, Case 1, Del Amo Torrance

Equipment Type	Other	No T-BACT
Nearest Receptor Distance (actual)	50	meters
Receptor Distance (Table 1 Emission look up)	50	meters

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
1.24E+00 FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/Chronic Pollutant Screening Level (lbs/yr) from Table 1	Acute Pollutant Screening Level (lbs/hr) from Table 1	Cancer/Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene			1.94E+00	1.49E-02		
Ethyl Benzene			2.22E+01			
Carbon Disulfide			1.05E+05	3.41E+00		
Styrene			1.18E+05	6.61E-02		
Perchloroethylene (Tetrachloroethylene)			9.22E+00	1.10E+01		
Toluene			3.93E+04	2.04E+01		
Trichloroethylene			2.77E+01			
o-Xylene			9.18E+04	1.21E+01		
p-Xylene			9.18E+04	1.21E+01		
Polychlorinated Dibenzo-p-Dioxins (PCDD)			5.79E-08			
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	8.41E-09	9.63E-13	5.79E-08		1.45E-01	
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.29E-08	2.62E-12	5.79E-08		3.95E-01	
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.43E-08	1.64E-12	5.79E-07		2.47E-02	
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	1.86E-08	2.13E-12	5.79E-07		3.21E-02	
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.69E-08	1.93E-12	5.79E-07		2.92E-02	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	7.94E-08	9.09E-12	5.79E-06		1.37E-02	
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.52E-07	1.74E-11	1.93E-04		7.89E-04	
Polychlorinated Dibenzofurans (PCDF)			8.19E-08			
2,3,7,8-Tetrachlorodibenzofuran	9.12E-08	1.04E-11	8.19E-07		1.11E-01	
1,2,3,7,8-Pentachlorodibenzofuran	9.76E-08	1.12E-11	2.73E-06		3.57E-02	
2,3,4,7,8-Pentachlorodibenzofuran	3.94E-08	4.51E-12	2.73E-07		1.44E-01	
1,2,3,4,7,8-Hexachlorodibenzofuran	7.74E-08	8.86E-12	8.19E-07		9.45E-02	
1,2,3,6,7,8-Hexachlorodibenzofuran	8.14E-08	9.32E-12	8.19E-07		9.94E-02	
2,3,4,6,7,8-Hexachlorodibenzofuran	5.59E-08	6.40E-12	8.19E-07		6.82E-02	
1,2,3,7,8,9-Hexachlorodibenzofuran	1.40E-08	1.60E-12	8.19E-07		1.71E-02	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.62E-07	1.86E-11	8.19E-06		1.98E-02	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.69E-08	3.07E-12	8.19E-06		3.28E-03	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	7.16E-08	8.20E-12	2.73E-04		2.62E-04	
TOTAL (APPLICATION SCREENING INDEX)					1.24E+00	

TIER 2 SCREENING RISK ASSESSMENT REPORT*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*A/N: Scenario 1, Case 1Fac: Del Amo TorranceApplication deemed complete date: 6/25/2018**1. Stack Data**

Equipment Type Other

Combustion Eff 0.0
No T-BACT

Operation Schedule 24 hrs/day
7 days/week
52 weeks/year

Stack Height 20 ft

Distance to Residential 400 m

Distance to Commercial 50 m

Meteorological Station Hawthorne Airport

2. Tier 2 Data

Dispersion Factors tables Point Source

For Chronic X/Q	Table 6
For Acute X/Q max	Table 6.4

Dilution Factors

Receptor	X/Q ($\mu\text{g}/\text{m}^3$)/(tons/yr)	X/Qmax ($\mu\text{g}/\text{m}^3$)/(lbs/hr)
Residential	0.33	15.54
Commercial - Worker	12.84	261.46

Intake and Adjustment Factors

	Residential	Worker
Year of Exposure	5	
Combined Exposure Factor (CEF) - Table 4	389.23	11.17
Worker Adjustment Factor (WAF) - Table 5	1	1.00

[illegible]

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/day)	R2 (lbs/day)	R2 (lbs/yr)	R2 (tons/yr)
Benzene						
Ethyl Benzene						
Carbon Disulfide						
Styrene						
Perchloroethylene (Tetrachloroethylene)						
Toluene						
Trichloroethylene						
o-Xylene						
p-Xylene						
Polychlorinated Dibenzo-p-Dioxins (PCDD)						
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	9.63E-13	9.63E-13	2.31E-11	2.31E-11	8.41E-09	4.21E-12
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.62E-12	2.62E-12	6.29E-11	6.29E-11	2.29E-08	1.14E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.64E-12	1.64E-12	3.93E-11	3.93E-11	1.43E-08	7.16E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	2.13E-12	2.13E-12	5.11E-11	5.11E-11	1.86E-08	9.29E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.93E-12	1.93E-12	4.64E-11	4.64E-11	1.69E-08	8.44E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	9.09E-12	9.09E-12	2.18E-10	2.18E-10	7.94E-08	3.97E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.74E-11	1.74E-11	4.18E-10	4.18E-10	1.52E-07	7.61E-11
Polychlorinated Dibenzofurans (PCDF)						
2,3,7,8-Tetrachlorodibenzofuran	1.04E-11	1.04E-11	2.50E-10	2.50E-10	9.12E-08	4.56E-11
1,2,3,7,8-Pentachlorodibenzofuran	1.12E-11	1.12E-11	2.68E-10	2.68E-10	9.76E-08	4.88E-11
2,3,4,7,8-Pentachlorodibenzofuran	4.51E-12	4.51E-12	1.08E-10	1.08E-10	3.94E-08	1.97E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	8.86E-12	8.86E-12	2.13E-10	2.13E-10	7.74E-08	3.87E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	9.32E-12	9.32E-12	2.24E-10	2.24E-10	8.14E-08	4.07E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	6.40E-12	6.40E-12	1.54E-10	1.54E-10	5.59E-08	2.79E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	1.60E-12	1.60E-12	3.84E-11	3.84E-11	1.40E-08	6.99E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.86E-11	1.86E-11	4.46E-10	4.46E-10	1.62E-07	8.12E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.07E-12	3.07E-12	7.38E-11	7.38E-11	2.69E-08	1.34E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	8.20E-12	8.20E-12	1.97E-10	1.97E-10	7.16E-08	3.58E-11
Total	1.18E-10	1.18E-10	2.83E-09	2.83E-09	1.03E-06	5.15E-10

TIER 2 RESULTS

A/N: Scenario 1, Case 1

Application deemed complete date: 06/25/18

5a. MICR

MICR Resident = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Resident} * CEF \text{ Resident} * MP \text{ Resident} * 1e-6 * MAAF$

MICR Worker = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Worker} * CEF \text{ Worker} * MP \text{ Worker} * WAF \text{ Worker} * 1e-6 * MAAF$

Compound	Residential	Commercial
Benzene		
Ethyl Benzene		
Carbon Disulfide		
Styrene		
Perchloroethylene (Tetrachloroethylene)		
Toluene		
Trichloroethylene		
o-Xylene		
p-Xylene		
Polychlorinated Dibenzo-p-Dioxins (PCDD)		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	2.80E-09	5.70E-10
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	7.63E-09	1.55E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	4.77E-10	9.70E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.19E-10	1.26E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	5.63E-10	1.14E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	2.65E-10	5.38E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.52E-11	3.10E-12
Polychlorinated Dibenzofurans (PCDF)		
2,3,7,8-Tetrachlorodibenzofuran	2.04E-09	6.18E-10
1,2,3,7,8-Pentachlorodibenzofuran	6.55E-10	1.98E-10
2,3,4,7,8-Pentachlorodibenzofuran	2.65E-09	8.01E-10
1,2,3,4,7,8-Hexachlorodibenzofuran	1.73E-09	5.24E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	1.82E-09	5.52E-10
2,3,4,6,7,8-Hexachlorodibenzofuran	1.25E-09	3.79E-10
1,2,3,7,8,9-Hexachlorodibenzofuran	3.13E-10	9.48E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.63E-10	1.10E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	6.01E-11	1.82E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	4.81E-12	1.46E-12
Total	2.33E-08	5.81E-09
	PASS	PASS

5b. Is Cancer Burden Calculation Needed (MICR >1E-6)?

NO

New X/Q at which MICR_{70yr} is one-in-a-million [(µg/m³)/(tons/yr)]:

New Distance, interpolated from X/Q table using New X/Q (meter):

Zone Impact Area (km²):

Zone of Impact Population (7000 person/km²):

Cancer Burden:

6. Hazard Index SummaryA/N: Scenario 1, Case 1Application deemed complete date: 06/25/18HIA = [Q(lb/hr) * (X/Q)_{max} * MWAFF] / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MP * MWAFF] / Chronic REL

HIC 8-hr= [Q(ton/yr) * (X/Q) * WAF * MWAFF] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL		9.28E-05		Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV		9.28E-05		Pass	Pass	Pass
Endocrine system - END		9.28E-05		Pass	Pass	Pass
Eye				Pass	Pass	Pass
Hematopoietic system - HEM		9.28E-05		Pass	Pass	Pass
Immune system - IMM				Pass	Pass	Pass
Kidney - KID				Pass	Pass	Pass
Nervous system - NS				Pass	Pass	Pass
Reproductive system - REP		9.28E-05		Pass	Pass	Pass
Respiratory system - RES		9.28E-05		Pass	Pass	Pass
Skin				Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene										
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene										
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total										

6a. Hazard Index Acute - Worker

A/N: Scenario 1, Case 1

Application deemed complete date: 06/25/18

 $HIA = [Q(lb/hr) * (X/Q)_{max} Worker * MWAF] / Acute REL$

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene										
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene										
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total										

DF Emissions for Scenario 1, Case 1:

Worst-case concentrations with blended flowrates [deep soil run 1 @ 350 scfm flowrate + shallow soil run 2 @ 150 scfm]

Dataset:

Sampling Location:

STACK SVE1B

Run Number:

S-1B-M428-1

Run Date:

04/11/18

Parameter

Catch Weight

Concentrations

Emission Rate

Shallow Run 2 @ 150 scfm

For HRA

(pg)

(ng/DSCM)

(12% CO₂)

(@ 7% O₂)

(gms/sec)

(lbs/hr)

(lbs/hr)

(lbs/hr)

PCDDs

2,3,7,8-TCDD	1.7	3.27E-04	3.49E-04	3.93E-04	5.40E-14	4.29E-13	5.3417E-13	9.629E-13
Other TCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41453E-12	9.415E-12
1,2,3,7,8-PeCDD	2.76	5.31E-04	5.66E-04	6.37E-04	8.77E-14	6.96E-13	1.92381E-12	2.62E-12
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.21026E-12	8.21E-12
1,2,3,4,7,8-HxCDD	2.54	4.89E-04	5.21E-04	5.87E-04	8.07E-14	6.41E-13	9.98259E-13	1.639E-12
1,2,3,6,7,8-HxCDD	2.43	4.67E-04	4.99E-04	5.61E-04	7.72E-14	6.13E-13	1.51481E-12	2.128E-12
1,2,3,7,8,9-HxCDD	2.48	4.77E-04	5.09E-04	5.73E-04	7.88E-14	6.26E-13	1.30728E-12	1.933E-12
Other HxCDD	14.15	2.72E-03	2.90E-03	3.27E-03	4.50E-13	3.57E-12	1.10399E-11	1.461E-11
1,2,3,4,6,7,8-HpCDD	13.1	2.52E-03	2.69E-03	3.02E-03	4.16E-13	3.30E-12	5.78657E-12	9.091E-12
Other HpCDD	14.8	2.85E-03	3.04E-03	3.42E-03	4.70E-13	3.73E-12	5.04431E-12	8.777E-12
OCDD	23.8	4.58E-03	4.88E-03	5.50E-03	7.56E-13	6.00E-12	1.14217E-11	1.742E-11
TOTAL PCDDs	77.76	1.50E-02	1.60E-02	1.80E-02	2.47E-12	1.96E-11	5.72295E-11	7.684E-11

PCDFs

2,3,7,8-TCDF	3.9	7.50E-04	8.00E-04	9.01E-04	1.24E-13	9.84E-13	9.45241E-12	1.044E-11
Other TCDF	26	5.00E-03	5.34E-03	6.00E-03	8.26E-13	6.56E-12	2.10195E-10	2.168E-10
1,2,3,7,8-PeCDF	2.72	5.23E-04	5.58E-04	6.28E-04	8.64E-14	6.86E-13	1.04825E-11	1.117E-11
2,3,4,7,8-PeCDF	3.23	6.21E-04	6.63E-04	7.46E-04	1.03E-13	8.15E-13	3.69613E-12	4.511E-12
Other PeCDF	17.85	3.43E-03	3.66E-03	4.12E-03	5.67E-13	4.50E-12	7.27714E-11	7.727E-11
1,2,3,4,7,8-HxCDF	7.43	1.43E-03	1.52E-03	1.72E-03	2.36E-13	1.87E-12	6.98327E-12	8.857E-12
1,2,3,6,7,8-HxCDF	5.41	1.04E-03	1.11E-03	1.25E-03	1.72E-13	1.36E-12	7.95274E-12	9.317E-12
2,3,4,6,7,8-HxCDF	1.64	3.15E-04	3.37E-04	3.79E-04	5.21E-14	4.14E-13	5.98349E-12	6.397E-12
1,2,3,7,8,9-HxCDF	1.85	3.56E-04	3.80E-04	4.27E-04	5.88E-14	4.67E-13	1.13459E-12	1.601E-12
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0
1,2,3,4,6,7,8-HpCDF	25.2	4.85E-03	5.17E-03	5.82E-03	8.01E-13	6.36E-12	1.22245E-11	1.858E-11
1,2,3,4,7,8,9-HpCDF	1.8	3.46E-04	3.69E-04	4.16E-04	5.72E-14	4.54E-13	2.62062E-12	3.075E-12
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39294E-12	4.393E-12
OCDF	11.6	2.23E-03	2.38E-03	2.68E-03	3.69E-13	2.93E-12	5.27153E-12	8.197E-12
TOTAL PCDFs	108.63	2.09E-02	2.23E-02	2.51E-02	3.45E-12	2.74E-11		

TOTAL PCDDs and PCDFs 186.39 3.59E-02 3.82E-02 4.30E-02 5.92E-12 4.70E-11

TIER 1/TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool VI.1

Application Deemed Complete Date	06/26/18
A/N	Scenario 1, Case 2
Facility Name	Del Amo Torrance

1. Stack Data	Input	Units
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Control Efficiency	0.000	
Does source have T-BACT?	NO	
Source type (Point or Volume)	P	P or V
Stack Height or Building Height	20	feet
Building Area	5000	ft ²
Distance-Residential	400	meters
Distance-Commercial	50	meters
Meteorological Station	Hawthorne Airport	
Project Duration (Short term options: 2, 5, or 9 years; Else 30 years)	5	years

Conversion Units (select units)

From

1 feet

To

0.3048 meter

Source Type	Other
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO

FOR SOURCE TYPE OTHER THAN BOILER, CREMATORY, ICE, PRESSURE WASHER, OR SPRAY BOOTH, FILL IN THE USER DEFINED TABLE BELOW

Fac Name: Del Amo Torrance

A/N: Scenario 1, Case 2

TAC Code	Compound	Emission Rate (lbs/hr)	Molecular Weight	R1 - Uncontrolled (lbs/hr)	Efficiency Factor (Fraction range 0-1)	R2-Controlled (lbs/hr)
B1	Benzene		78.11		0.00000	
E3	Ethyl Benzene		106.16		0.00000	
C3	Carbon Disulfide		76.14		0.00000	
S6	Styrene		104.16		0.00000	
P2	Perchloroethylene (Tetrachloroethylene)		165.83		0.00000	
T3	Toluene		92.13		0.00000	
T8	Trichloroethylene		130.4		0.00000	
X3	o-Xylene		106.18		0.00000	
X4	p-Xylene		106.17		0.00000	
P22	Polychlorinated Dibenzo-p-Dioxins (PCDD)		459.7548		0.00000	
P23	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1.78E-12	321.9744	1.78E-12	0.00000	1.78057E-12
P24	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	6.41E-12	356.4195	6.41E-12	0.00000	6.41269E-12
P25	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	3.33E-12	390.8646	3.33E-12	0.00000	3.32753E-12
P26	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	5.05E-12	390.8646	5.05E-12	0.00000	5.04936E-12
P27	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	4.36E-12	390.8646	4.36E-12	0.00000	4.3576E-12
P28	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1.93E-11	425.3097	1.93E-11	0.00000	1.92886E-11
P29	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3.81E-11	459.7548	3.81E-11	0.00000	3.80722E-11
P30	Polychlorinated Dibenzofurans (PCDF)		443.76		0.00000	
P31	2,3,7,8-Tetrachlorodibenzofuran	3.15E-11	305.97156	3.15E-11	0.00000	3.1508E-11
P32	1,2,3,7,8-Pentachlorodibenzofuran	3.49E-11	340.4201	3.49E-11	0.00000	3.49416E-11
P33	2,3,4,7,8-Pentachlorodibenzofuran	1.23E-11	340.4201	1.23E-11	0.00000	1.23204E-11
P34	1,2,3,4,7,8-Hexachlorodibenzofuran	2.33E-11	374.8652	2.33E-11	0.00000	2.32776E-11
P35	1,2,3,6,7,8-Hexachlorodibenzofuran	2.65E-11	374.8652	2.65E-11	0.00000	2.65091E-11
P37	2,3,4,6,7,8-Hexachlorodibenzofuran	1.99E-11	374.8652	1.99E-11	0.00000	1.9945E-11
P36	1,2,3,7,8,9-Hexachlorodibenzofuran	3.78E-12	374.8652	3.78E-12	0.00000	3.78197E-12
P38	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.07E-11	409.3103	4.07E-11	0.00000	4.07483E-11
P39	1,2,3,4,7,8,9-Heptachlorodibenzofuran	8.74E-12	409.3103	8.74E-12	0.00000	8.7354E-12
P40	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	1.76E-11	443.7554	1.76E-11	0.00000	1.75718E-11

TIER 1 SCREENING RISK ASSESSMENT REPORT

(Procedure Version 8.1 & Package N, September 1, 2017)

Application deemed complete date: 6/26/2018

A/N Scenario 1, Case 2, Del Amo Torrance

Equipment Type	Other	No T-BACT
Nearest Receptor Distance (actual)	50	meters
Receptor Distance (Table 1 Emission look up)	50	meters

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
3.14E+00	
FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/Chronic Pollutant Screening Level (lbs/yr) from Table 1	Acute Pollutant Screening Level (lbs/hr) from Table 1	Cancer/Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene			1.94E+00	1.49E-02		
Ethyl Benzene			2.22E+01			
Carbon Disulfide			1.05E+05	3.41E+00		
Styrene			1.18E+05	6.61E-02		
Perchloroethylene (Tetrachloroethylene)			9.22E+00	1.10E+01		
Toluene			3.93E+04	2.04E+01		
Trichloroethylene			2.77E+01			
o-Xylene			9.18E+04	1.21E+01		
p-Xylene			9.18E+04	1.21E+01		
Polychlorinated Dibenzo-p-Dioxins (PCDD)			5.79E-08			
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1.56E-08	1.78E-12	5.79E-08		2.69E-01	
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.60E-08	6.41E-12	5.79E-08		9.68E-01	
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	2.91E-08	3.33E-12	5.79E-07		5.02E-02	
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	4.41E-08	5.05E-12	5.79E-07		7.62E-02	
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	3.81E-08	4.36E-12	5.79E-07		6.57E-02	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1.69E-07	1.93E-11	5.79E-06		2.91E-02	
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3.33E-07	3.81E-11	1.93E-04		1.72E-03	
Polychlorinated Dibenzofurans (PCDF)			8.19E-08			
2,3,7,8-Tetrachlorodibenzofuran	2.75E-07	3.15E-11	8.19E-07		3.36E-01	
1,2,3,7,8-Pentachlorodibenzofuran	3.05E-07	3.49E-11	2.73E-06		1.12E-01	
2,3,4,7,8-Pentachlorodibenzofuran	1.08E-07	1.23E-11	2.73E-07		3.94E-01	
1,2,3,4,7,8-Hexachlorodibenzofuran	2.03E-07	2.33E-11	8.19E-07		2.48E-01	
1,2,3,6,7,8-Hexachlorodibenzofuran	2.32E-07	2.65E-11	8.19E-07		2.83E-01	
2,3,4,6,7,8-Hexachlorodibenzofuran	1.74E-07	1.99E-11	8.19E-07		2.13E-01	
1,2,3,7,8,9-Hexachlorodibenzofuran	3.30E-08	3.78E-12	8.19E-07		4.03E-02	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.56E-07	4.07E-11	8.19E-06		4.35E-02	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.63E-08	8.74E-12	8.19E-06		9.32E-03	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	1.54E-07	1.76E-11	2.73E-04		5.62E-04	
TOTAL (APPLICATION SCREENING INDEX)					3.14E+00	

TIER 2 SCREENING RISK ASSESSMENT REPORT*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*A/N: Scenario 1, Case 2Fac: Del Amo TorranceApplication deemed complete date: 6/26/2018**1. Stack Data**

Equipment Type Other

Combustion Eff 0.0
No T-BACT

Operation Schedule 24 hrs/day
7 days/week
52 weeks/year

Stack Height 20 ft

Distance to Residential 400 m

Distance to Commercial 50 m

Meteorological Station Hawthorne Airport

2. Tier 2 Data

Dispersion Factors tables Point Source

For Chronic X/Q	Table 6
For Acute X/Q max	Table 6.4

Dilution Factors

Receptor	X/Q ($\mu\text{g}/\text{m}^3$)/(tons/yr)	X/Qmax ($\mu\text{g}/\text{m}^3$)/(lbs/hr)
Residential	0.33	15.54
Commercial - Worker	12.84	261.46

Intake and Adjustment Factors

	Residential	Worker
Year of Exposure	5	
Combined Exposure Factor (CEF) - Table 4	389.23	11.17
Worker Adjustment Factor (WAF) - Table 5	1	1.00

[illegible]

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/day)	R2 (lbs/day)	R2 (lbs/yr)	R2 (tons/yr)
Benzene						
Ethyl Benzene						
Carbon Disulfide						
Styrene						
Perchloroethylene (Tetrachloroethylene)						
Toluene						
Trichloroethylene						
o-Xylene						
p-Xylene						
Polychlorinated Dibenzo-p-Dioxins (PCDD)						
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1.78E-12	1.78E-12	4.27E-11	4.27E-11	1.56E-08	7.78E-12
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	6.41E-12	6.41E-12	1.54E-10	1.54E-10	5.60E-08	2.80E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	3.33E-12	3.33E-12	7.99E-11	7.99E-11	2.91E-08	1.45E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	5.05E-12	5.05E-12	1.21E-10	1.21E-10	4.41E-08	2.21E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	4.36E-12	4.36E-12	1.05E-10	1.05E-10	3.81E-08	1.90E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1.93E-11	1.93E-11	4.63E-10	4.63E-10	1.69E-07	8.43E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3.81E-11	3.81E-11	9.14E-10	9.14E-10	3.33E-07	1.66E-10
Polychlorinated Dibenzofurans (PCDF)						
2,3,7,8-Tetrachlorodibenzofuran	3.15E-11	3.15E-11	7.56E-10	7.56E-10	2.75E-07	1.38E-10
1,2,3,7,8-Pentachlorodibenzofuran	3.49E-11	3.49E-11	8.39E-10	8.39E-10	3.05E-07	1.53E-10
2,3,4,7,8-Pentachlorodibenzofuran	1.23E-11	1.23E-11	2.96E-10	2.96E-10	1.08E-07	5.38E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	2.33E-11	2.33E-11	5.59E-10	5.59E-10	2.03E-07	1.02E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	2.65E-11	2.65E-11	6.36E-10	6.36E-10	2.32E-07	1.16E-10
2,3,4,6,7,8-Hexachlorodibenzofuran	1.99E-11	1.99E-11	4.79E-10	4.79E-10	1.74E-07	8.71E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	3.78E-12	3.78E-12	9.08E-11	9.08E-11	3.30E-08	1.65E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.07E-11	4.07E-11	9.78E-10	9.78E-10	3.56E-07	1.78E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	8.74E-12	8.74E-12	2.10E-10	2.10E-10	7.63E-08	3.82E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	1.76E-11	1.76E-11	4.22E-10	4.22E-10	1.54E-07	7.68E-11
Total	2.98E-10	2.98E-10	7.14E-09	7.14E-09	2.60E-06	1.30E-09

TIER 2 RESULTS

A/N: Scenario 1, Case 2

Application deemed complete date: 06/26/18

5a. MICR

MICR Resident = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Resident} * CEF \text{ Resident} * MP \text{ Resident} * 1e-6 * MAAF$

MICR Worker = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Worker} * CEF \text{ Worker} * MP \text{ Worker} * WAF \text{ Worker} * 1e-6 * MAAF$

Compound	Residential	Commercial
Benzene		
Ethyl Benzene		
Carbon Disulfide		
Styrene		
Perchloroethylene (Tetrachloroethylene)		
Toluene		
Trichloroethylene		
o-Xylene		
p-Xylene		
Polychlorinated Dibenzo-p-Dioxins (PCDD)		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	5.18E-09	1.05E-09
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	1.87E-08	3.80E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	9.69E-10	1.97E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	1.47E-09	2.99E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.27E-09	2.58E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	5.61E-10	1.14E-10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3.32E-11	6.76E-12
Polychlorinated Dibenzofurans (PCDF)		
2,3,7,8-Tetrachlorodibenzofuran	6.16E-09	1.87E-09
1,2,3,7,8-Pentachlorodibenzofuran	2.05E-09	6.21E-10
2,3,4,7,8-Pentachlorodibenzofuran	7.22E-09	2.19E-09
1,2,3,4,7,8-Hexachlorodibenzofuran	4.55E-09	1.38E-09
1,2,3,6,7,8-Hexachlorodibenzofuran	5.18E-09	1.57E-09
2,3,4,6,7,8-Hexachlorodibenzofuran	3.90E-09	1.18E-09
1,2,3,7,8,9-Hexachlorodibenzofuran	7.39E-10	2.24E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	7.97E-10	2.41E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.71E-10	5.17E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	1.03E-11	3.12E-12
Total	5.89E-08	1.51E-08
	PASS	PASS

5b. Is Cancer Burden Calculation Needed (MICR > 1E-6)?

NO

New X/Q at which MICR_{70yr} is one-in-a-million [(µg/m³)/(tons/yr)]:

New Distance, interpolated from X/Q table using New X/Q (meter):

Zone Impact Area (km²):

Zone of Impact Population (7000 person/km²):

Cancer Burden:

6. Hazard Index SummaryA/N: Scenario 1, Case 2Application deemed complete date: 06/26/18HIA = $[Q(\text{lb/hr}) * (X/Q)_{\text{max}} * \text{MWF}] / \text{Acute REL}$ HIC = $[Q(\text{ton/yr}) * (X/Q) * \text{MP} * \text{MWF}] / \text{Chronic REL}$ HIC 8-hr = $[Q(\text{ton/yr}) * (X/Q) * \text{WAF} * \text{MWF}] / 8\text{-hr Chronic REL}$

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL		2.40E-04		Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV		2.40E-04		Pass	Pass	Pass
Endocrine system - END		2.40E-04		Pass	Pass	Pass
Eye				Pass	Pass	Pass
Hematopoietic system - HEM		2.40E-04		Pass	Pass	Pass
Immune system - IMM				Pass	Pass	Pass
Kidney - KID				Pass	Pass	Pass
Nervous system - NS				Pass	Pass	Pass
Reproductive system - REP		2.40E-04		Pass	Pass	Pass
Respiratory system - RES		2.40E-04		Pass	Pass	Pass
Skin				Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene										
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene										
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total										

6a. Hazard Index Acute - Worker

A/N: Scenario 1, Case 2

Application deemed complete date: 06/26/18

HIA = [Q(lb/hr) * (X/Q)max Worker * MWAF] / Acute REL

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene										
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene										
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total										

DF Emissions for Scenario 1, Case 2:

Worst-case concentrations (i.e., shallow soil Run 2) x 500 scfm flowrate

Dataset:

Sampling Location:

STACK SVE1A

Run Number:

S-1A-M428-2

Run Date:

04/05/18

Parameter

Catch Weight

	(pg)	(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)
PCDDs						
2,3,7,8-TCDD	3.75	9.51E-04	2.68E-03	2.02E-03	2.24E-13	1.78E-12
Other TCDD	62.15	1.68E-02	4.72E-02	3.57E-02	3.95E-12	3.14E-11
1,2,3,7,8-PeCDD	12.7	3.42E-03	9.64E-03	7.29E-03	8.08E-13	6.41E-12
Other PeCDD	54.2	1.46E-02	4.12E-02	3.11E-02	3.45E-12	2.74E-11
1,2,3,4,7,8-HxCDD	6.59	1.78E-03	5.00E-03	3.78E-03	4.19E-13	3.33E-12
1,2,3,6,7,8-HxCDD	10	2.70E-03	7.59E-03	5.74E-03	6.36E-13	5.05E-12
1,2,3,7,8,9-HxCDD	8.63	2.33E-03	6.55E-03	4.95E-03	5.49E-13	4.36E-12
Other HxCDD	72.88	1.96E-02	5.53E-02	4.18E-02	4.64E-12	3.68E-11
1,2,3,4,6,7,8-HpCDD	38.2	1.03E-02	2.90E-02	2.19E-02	2.43E-12	1.93E-11
Other HpCDD	33.3	8.98E-03	2.53E-02	1.91E-02	2.12E-12	1.68E-11
OCDD	75.4	2.03E-02	5.73E-02	4.33E-02	4.80E-12	3.81E-11
TOTAL PCDDs	377.80	1.02E-01	2.87E-01	2.17E-01	2.40E-11	1.91E-10
PCDFs						
2,3,7,8-TCDF	62.4	1.68E-02	4.74E-02	3.58E-02	3.97E-12	3.15E-11
Other TCDF	1387.6	3.74E-01	1.05E+00	7.96E-01	8.83E-11	7.01E-10
1,2,3,7,8-PeCDF	69.2	1.87E-02	5.25E-02	3.97E-02	4.40E-12	3.49E-11
2,3,4,7,8-PeCDF	24.4	6.58E-03	1.85E-02	1.40E-02	1.55E-12	1.23E-11
Other PeCDF	480.4	1.30E-01	3.65E-01	2.76E-01	3.06E-11	2.43E-10
1,2,3,4,7,8-HxCDF	46.1	1.24E-02	3.50E-02	2.65E-02	2.93E-12	2.33E-11
1,2,3,6,7,8-HxCDF	52.5	1.42E-02	3.99E-02	3.01E-02	3.34E-12	2.65E-11
2,3,4,6,7,8-HxCDF	39.5	1.06E-02	3.00E-02	2.27E-02	2.51E-12	1.99E-11
1,2,3,7,8,9-HxCDF	7.49	2.02E-03	5.69E-03	4.30E-03	4.77E-13	3.78E-12
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-HpCDF	80.7	2.18E-02	6.13E-02	4.63E-02	5.13E-12	4.07E-11
1,2,3,4,7,8,9-HpCDF	17.3	4.66E-03	1.31E-02	9.93E-03	1.10E-12	8.74E-12
Other HpCDF	29	7.82E-03	2.20E-02	1.66E-02	1.85E-12	1.46E-11
OCDF	34.8	9.38E-03	2.64E-02	2.00E-02	2.21E-12	1.76E-11
TOTAL PCDFs	2331.39	6.28E-01	1.77E+00	1.34E+00	1.48E-10	1.18E-09
TOTAL PCDDs and PCDFs	2709.19	7.30E-01	2.06E+00	1.55E+00	1.72E-10	1.37E-09

TIER 3 SCREENING RISK ASSESSMENT DATA INPUT

(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool VI.1

Application Deemed Complete Date	06/26/18
A/N	Scenario 2, Case 1
Facility Name	Del Amo Torrance

1. Stack Data	Input	Units
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Control Efficiency	0.000	
Does source have T-BACT?	NO	
Source type (Point or Volume)	P	P or V
Stack Height or Building Height	20	feet
Building Area	5000	ft ²
Distance-Residential	400	meters
Distance-Commercial	50	meters
Meteorological Station	Hawthorne Airport	
Project Duration (Short term options: 2, 5, or 9 years; Else 30 years)	5	years

Conversion Units (select units)

From

1 feet

To

0.3048 meter

Source Type	Other
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	YES

FOR SOURCE TYPE OTHER THAN BOILER, CREMATORY, ICE, PRESSURE WASHER, OR SPRAY BOOTH, FILL IN THE USER DEFINED TABLE BELOW

Fac Name: Del Amo Torrance

A/N: Scenario 2, Case 1

TAC Code	Compound	Emission Rate (lbs/hr)	Molecular Weight	R1 - Uncontrolled (lbs/hr)	Efficiency Factor (Fraction range 0-1)	R2-Controlled (lbs/hr)
B1	Benzene	8.46E-02	78.11	8.46E-02	0.00000	0.084632375
E3	Ethyl Benzene	2.35E-01	106.16	2.35E-01	0.00000	0.234952528
C3	Carbon Disulfide		76.14		0.00000	
S6	Styrene		104.16		0.00000	
P2	Perchloroethylene (Tetrachloroethylene)		165.83		0.00000	
T3	Toluene	2.62E-03	92.13	2.62E-03	0.00000	0.002624896
T8	Trichloroethylene		130.4		0.00000	
X3	o-Xylene		106.18		0.00000	
X4	p-Xylene		106.17		0.00000	
P22	Polychlorinated Dibenzo-p-Dioxins (PCDD)		459.7548		0.00000	
P23	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	9.63E-13	321.9744	9.63E-13	0.00000	9.62946E-13
P24	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.62E-12	356.4195	2.62E-12	0.00000	2.61994E-12
P25	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.64E-12	390.8646	1.64E-12	0.00000	1.6389E-12
P26	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	2.13E-12	390.8646	2.13E-12	0.00000	2.12771E-12
P27	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.93E-12	390.8646	1.93E-12	0.00000	1.93279E-12
P28	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	9.09E-12	425.3097	9.09E-12	0.00000	9.09066E-12
P29	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.74E-11	459.7548	1.74E-11	0.00000	1.74245E-11
P30	Polychlorinated Dibenzofurans (PCDF)		443.76		0.00000	
P31	2,3,7,8-Tetrachlorodibenzofuran	1.04E-11	305.97156	1.04E-11	0.00000	1.04361E-11
P32	1,2,3,7,8-Pentachlorodibenzofuran	1.12E-11	340.4201	1.12E-11	0.00000	1.11685E-11
P33	2,3,4,7,8-Pentachlorodibenzofuran	4.51E-12	340.4201	4.51E-12	0.00000	4.51081E-12
P34	1,2,3,4,7,8-Hexachlorodibenzofuran	8.86E-12	374.8652	8.86E-12	0.00000	8.85727E-12
P35	1,2,3,6,7,8-Hexachlorodibenzofuran	9.32E-12	374.8652	9.32E-12	0.00000	9.31726E-12
P37	2,3,4,6,7,8-Hexachlorodibenzofuran	6.40E-12	374.8652	6.40E-12	0.00000	6.39714E-12
P36	1,2,3,7,8,9-Hexachlorodibenzofuran	1.60E-12	374.8652	1.60E-12	0.00000	1.6012E-12
P38	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.86E-11	409.3103	1.86E-11	0.00000	1.85805E-11
P39	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.07E-12	409.3103	3.07E-12	0.00000	3.07462E-12
P40	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	8.20E-12	443.7554	8.20E-12	0.00000	8.1973E-12

TIER 3 SCREEN INPUT & CANCER BURDEN CALCULATION*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*

Screening program used	AERSCREEN
Convert 1-hr to Annual Conc. Factor	0.1

Instructions: Run a screening program at 1 lb/hr rate to get the max 1-hr concentrations at residential & commercial receptors. Enter values into the yellow highlighted cells in the table below. Review risk result in Tier 3 Report.

Modeling emissions rate	0.1260	g/sec
Modeling emissions rate	1.00	lbs/hr
Modeling emissions rate	4.38	tons/yr
Max Hours per day	24	hr/day
Days per week	7	dy/wk
Weeks per year	52	wk/yr

MODELING RESULTS - MAX ONE HOUR

Distance residential	400	meters
Max. 1-hr Conc. at Residential receptor	1.31E+00	µg/m³
Annualized Conc. Residential	0.13	µg/m³
Distance Commerical	50	meters
Max. 1-hr Conc. at Comm. receptor	2.10E+01	µg/m³
Annualized Conc. Commercial	2.10	µg/m³

Annualized X/Q

X/Q Residential	0.030	(µg/m³)/(tons/yr)
X/Q Commercial	0.480	(µg/m³)/(tons/yr)

Hourly X/Q (X/Q Max)

X/Q Residential	1.311	(µg/m³)/(lbs/hr)
X/Q Commercial	21.019	(µg/m³)/(lbs/hr)

A/N: Scenario 2, Case 1**Fac:** Del Amo Torrance**SCREEN INPUT DATA - BRITISH UNITS**

Temperature	1550.00	°F
Stack diameter	18.00	in
Stack height	20.00	ft
Actual exhaust rate	500.00	acfm
Modeling emissions rate	1.00	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	1116.333	K
Stack diameter	0.457	meters
Stack area	0.164	m²
Stack height	6.096	meters
Stack velocity	1.438	m/s
Modeling emissions rate	0.12611	g/s

TIER 3 SCREENING RISK ASSESSMENT REPORT*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*A/N: Scenario 2, Case 1Fac: Del Amo TorranceApplication deemed complete date: 6/26/2018**1. Stack Data**

Equipment Type Other

Combustion Eff 0.0
No T-BACT

Operation Schedule 24 hrs/day
7 days/week
52 weeks/year

Stack Height 20 ft

Distance to Residential 400 m

Distance to Commercial 50 m

Meteorological Station Hawthorne Airport

2. Tier 3 Data

Dispersion Factors tables

Point Source

For Chronic X/Q	Table 6
For Acute X/Q max	Table 6.4

Dilution Factors

Receptor	X/Q ($\mu\text{g}/\text{m}^3$)/(tons/yr)	X/Qmax ($\mu\text{g}/\text{m}^3$)/(lbs/hr)
Residential	0.03	1.31
Commercial - Worker	0.48	21.02

Intake and Adjustment Factors

	Residential	Worker
Year of Exposure	5	
Combined Exposure Factor (CEF) - Table 4	389.23	11.17
Worker Adjustment Factor (WAF) - Table 5	1	1.00

[illegible]

4. Emission Calculations

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/day)	R2 (lbs/day)	R2 (lbs/yr)	R2 (tons/yr)
Benzene	8.46E-02	8.46E-02	2.03E+00	2.03E+00	7.39E+02	3.70E-01
Ethyl Benzene	2.35E-01	2.35E-01	5.64E+00	5.64E+00	2.05E+03	1.03E+00
Carbon Disulfide						
Styrene						
Perchloroethylene (Tetrachloroethylene)						
Toluene	2.62E-03	2.62E-03	6.30E-02	6.30E-02	2.29E+01	1.15E-02
Trichloroethylene						
o-Xylene						
p-Xylene						
Polychlorinated Dibenzo-p-Dioxins (PCDD)						
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	9.63E-13	9.63E-13	2.31E-11	2.31E-11	8.41E-09	4.21E-12
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.62E-12	2.62E-12	6.29E-11	6.29E-11	2.29E-08	1.14E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.64E-12	1.64E-12	3.93E-11	3.93E-11	1.43E-08	7.16E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	2.13E-12	2.13E-12	5.11E-11	5.11E-11	1.86E-08	9.29E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.93E-12	1.93E-12	4.64E-11	4.64E-11	1.69E-08	8.44E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	9.09E-12	9.09E-12	2.18E-10	2.18E-10	7.94E-08	3.97E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.74E-11	1.74E-11	4.18E-10	4.18E-10	1.52E-07	7.61E-11
Polychlorinated Dibenzofurans (PCDF)						
2,3,7,8-Tetrachlorodibenzofuran	1.04E-11	1.04E-11	2.50E-10	2.50E-10	9.12E-08	4.56E-11
1,2,3,7,8-Pentachlorodibenzofuran	1.12E-11	1.12E-11	2.68E-10	2.68E-10	9.76E-08	4.88E-11
2,3,4,7,8-Pentachlorodibenzofuran	4.51E-12	4.51E-12	1.08E-10	1.08E-10	3.94E-08	1.97E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	8.86E-12	8.86E-12	2.13E-10	2.13E-10	7.74E-08	3.87E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	9.32E-12	9.32E-12	2.24E-10	2.24E-10	8.14E-08	4.07E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	6.40E-12	6.40E-12	1.54E-10	1.54E-10	5.59E-08	2.79E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	1.60E-12	1.60E-12	3.84E-11	3.84E-11	1.40E-08	6.99E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.86E-11	1.86E-11	4.46E-10	4.46E-10	1.62E-07	8.12E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.07E-12	3.07E-12	7.38E-11	7.38E-11	2.69E-08	1.34E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	8.20E-12	8.20E-12	1.97E-10	1.97E-10	7.16E-08	3.58E-11
Total	3.22E-01	3.22E-01	7.73E+00	7.73E+00	2.81E+03	1.41E+00

TIER 3 RESULTS

A/N: Scenario 2, Case 1

Application deemed complete date: 06/26/18

5a. MICR

MICR Resident = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Resident} * CEF \text{ Resident} * MP \text{ Resident} * 1e-6 * MWF$

MICR Worker = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Worker} * CEF \text{ Worker} * MP \text{ Worker} * WAF \text{ Worker} * 1e-6 * MWF$

Compound	Residential	Commercial
Benzene	4.31E-07	1.98E-07
Ethyl Benzene	1.04E-07	4.79E-08
Carbon Disulfide		
Styrene		
Perchloroethylene (Tetrachloroethylene)		
Toluene		
Trichloroethylene		
o-Xylene		
p-Xylene		
Polychlorinated Dibenzo-p-Dioxins (PCDD)		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	2.54E-10	2.13E-11
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	6.92E-10	5.80E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	4.33E-11	3.63E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	5.62E-11	4.71E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	5.10E-11	4.28E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	2.40E-11	2.01E-12
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.38E-12	1.16E-13
Polychlorinated Dibenzofurans (PCDF)		
2,3,7,8-Tetrachlorodibenzofuran	1.85E-10	2.31E-11
1,2,3,7,8-Pentachlorodibenzofuran	5.94E-11	7.42E-12
2,3,4,7,8-Pentachlorodibenzofuran	2.40E-10	2.99E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	1.57E-10	1.96E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	1.65E-10	2.06E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	1.13E-10	1.42E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	2.84E-11	3.54E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.29E-11	4.11E-12
1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.45E-12	6.80E-13
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	4.36E-13	5.44E-14
Total	5.37E-07	2.46E-07
	PASS	PASS

5b. Is Cancer Burden Calculation Needed (MICR >1E-6)?

NO

New X/Q at which MICR_{70yr} is one-in-a-million [(µg/m³)/(tons/yr)]:

New Distance, interpolated from X/Q table using New X/Q (meter):

Zone Impact Area (km²):

Zone of Impact Population (7000 person/km²):

Cancer Burden:

6. Hazard Index Summary

A/N: Scenario 2, Case 1

Application deemed complete date: 06/26/18

HIA = [Q(lb/hr) * (X/Q)max * MWF] / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MP * MWF] / Chronic REL

HIC 8-hr= [Q(ton/yr) * (X/Q) * WAF * MWF] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL		2.50E-04		Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV	6.59E-02	2.68E-04		Pass	Pass	Pass
Endocrine system - END		2.50E-04		Pass	Pass	Pass
Eye	1.49E-06			Pass	Pass	Pass
Hematopoietic system - HEM	6.59E-02	5.91E-02	5.91E-02	Pass	Pass	Pass
Immune system - IMM	6.59E-02			Pass	Pass	Pass
Kidney - KID		2.46E-04		Pass	Pass	Pass
Nervous system - NS	1.49E-06	1.83E-05		Pass	Pass	Pass
Reproductive system - REP	6.59E-02	2.68E-04		Pass	Pass	Pass
Respiratory system - RES	1.49E-06	2.18E-05		Pass	Pass	Pass
Skin				Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene			4.11E-03		4.11E-03	4.11E-03		4.11E-03		
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene			9.30E-08	9.30E-08			9.30E-08	9.30E-08	9.30E-08	
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total			4.11E-03	9.30E-08	4.11E-03	4.11E-03	9.30E-08	4.11E-03	9.30E-08	

6a. Hazard Index Acute - Worker

A/N: Scenario 2, Case 1

Application deemed complete date: 06/26/18

HIA = [Q(lb/hr) * (X/Q)max Worker * MWAF] / Acute REL

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene			6.59E-02		6.59E-02	6.59E-02		6.59E-02		
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene			1.49E-06	1.49E-06			1.49E-06	1.49E-06	1.49E-06	
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total			6.59E-02	1.49E-06	6.59E-02	6.59E-02	1.49E-06	6.59E-02	1.49E-06	

DF Emissions for Scenario 1, Case 1:

Worst-case concentrations with blended flowrates [deep soil run 1 @ 350 scfm flowrate + shallow soil run 2 @ 150 scfm]

Dataset:
Sampling Location:
Run Number:
Run Date:
Parameter

STACK SVE1B
S-1B-M428-1
04/11/18

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		Shallow Run 2 @ 150 scfm	For HRA
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	(lbs/hr)	(lbs/hr)
PCDDs								
2,3,7,8-TCDD	1.7	3.27E-04	3.49E-04	3.93E-04	5.40E-14	4.29E-13	5.3417E-13	9.629E-13
Other TCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41453E-12	9.415E-12
1,2,3,7,8-PeCDD	2.76	5.31E-04	5.66E-04	6.37E-04	8.77E-14	6.96E-13	1.92381E-12	2.62E-12
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.21026E-12	8.21E-12
1,2,3,4,7,8-HxCDD	2.54	4.89E-04	5.21E-04	5.87E-04	8.07E-14	6.41E-13	9.98259E-13	1.639E-12
1,2,3,6,7,8-HxCDD	2.43	4.67E-04	4.99E-04	5.61E-04	7.72E-14	6.13E-13	1.51481E-12	2.128E-12
1,2,3,7,8,9-HxCDD	2.48	4.77E-04	5.09E-04	5.73E-04	7.88E-14	6.26E-13	1.30728E-12	1.933E-12
Other HxCDD	14.15	2.72E-03	2.90E-03	3.27E-03	4.50E-13	3.57E-12	1.10399E-11	1.461E-11
1,2,3,4,6,7,8-HpCDD	13.1	2.52E-03	2.69E-03	3.02E-03	4.16E-13	3.30E-12	5.78657E-12	9.091E-12
Other HpCDD	14.8	2.85E-03	3.04E-03	3.42E-03	4.70E-13	3.73E-12	5.04431E-12	8.777E-12
OCDD	23.8	4.58E-03	4.88E-03	5.50E-03	7.56E-13	6.00E-12	1.14217E-11	1.742E-11
TOTAL PCDDs	77.76	1.50E-02	1.60E-02	1.80E-02	2.47E-12	1.96E-11	5.72295E-11	7.684E-11
PCDFs								
2,3,7,8-TCDF	3.9	7.50E-04	8.00E-04	9.01E-04	1.24E-13	9.84E-13	9.45241E-12	1.044E-11
Other TCDF	26	5.00E-03	5.34E-03	6.00E-03	8.26E-13	6.56E-12	2.10195E-10	2.168E-10
1,2,3,7,8-PeCDF	2.72	5.23E-04	5.58E-04	6.28E-04	8.64E-14	6.86E-13	1.04825E-11	1.117E-11
2,3,4,7,8-PeCDF	3.23	6.21E-04	6.63E-04	7.46E-04	1.03E-13	8.15E-13	3.69613E-12	4.511E-12
Other PeCDF	17.85	3.43E-03	3.66E-03	4.12E-03	5.67E-13	4.50E-12	7.27714E-11	7.727E-11
1,2,3,4,7,8-HxCDF	7.43	1.43E-03	1.52E-03	1.72E-03	2.36E-13	1.87E-12	6.98327E-12	8.857E-12
1,2,3,6,7,8-HxCDF	5.41	1.04E-03	1.11E-03	1.25E-03	1.72E-13	1.36E-12	7.95274E-12	9.317E-12
2,3,4,6,7,8-HxCDF	1.64	3.15E-04	3.37E-04	3.79E-04	5.21E-14	4.14E-13	5.98349E-12	6.397E-12
1,2,3,7,8,9-HxCDF	1.85	3.56E-04	3.80E-04	4.27E-04	5.88E-14	4.67E-13	1.13459E-12	1.601E-12
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0
1,2,3,4,6,7,8-HpCDF	25.2	4.85E-03	5.17E-03	5.82E-03	8.01E-13	6.36E-12	1.22245E-11	1.858E-11
1,2,3,4,7,8,9-HpCDF	1.8	3.46E-04	3.69E-04	4.16E-04	5.72E-14	4.54E-13	2.62062E-12	3.075E-12
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39294E-12	4.393E-12
OCDF	11.6	2.23E-03	2.38E-03	2.68E-03	3.69E-13	2.93E-12	5.27153E-12	8.197E-12
TOTAL PCDFs	108.63	2.09E-02	2.23E-02	2.51E-02	3.45E-12	2.74E-11		
TOTAL PCDDs and PCDFs	186.39	3.59E-02	3.82E-02	4.30E-02	5.92E-12	4.70E-11		

TAC Emissions for HRAs

Dataset: Scenario 2, Case 1 - Blended flow rate assuming 150 scfm from shallow wells and 350 scfm from deep wells with worst-case/representative effluent TAC concentrations

shallow soil = worst-case detected effluent data on April 5, 2018 during shallow constant rate testing
deep soil = representative effluent TAC concentrations for deep soil (i.e., detected effluent data on April 13, 2018 during Day 4 of deep constant rate testing)

Study	Sample Location	Sample ID	Sample Date	Time	Benzene	Ethylbenzene	Toluene	Average Flow Rate	Benzene Emission Rate	Ethylbenzene Emission Rate	Toluene Emission Rate
Analytical Method EPA TO-15M					ppmv	ppmv	ppmv	scfm	(lbs/hr)	(lbs/hr)	(lbs/hr)
Molecular Weight (g/mol)					78.1	106.16	92.14				
Shallow Zone	Effluent	VSS01367	04/05/18	1205	1.3	2.2	0.033	150	0.0024	0.0055	7.22E-05
Deep Zone	Effluent	VSS01391	04/13/18	1151	19	39	0.5	350	0.0822	0.2294	2.55E-03
								FOR HRA	0.0846	0.235	2.62E-03

Dataset: Scenario 2, Case 2 - Assumed total flow rate of 500 scfm multiplied by a benzene concentration of 25 ppmv and ethylbenzene concentration of 50 ppmv

Toluene rate assumed to be Case 1

Revised 1 (B):2 (EB) ratio	Benzene	Ethylbenzene	Average Flow Rate	Benzene Emission Rate	Ethylbenzene Emission Rate	Toluene Emission Rate
	ppmv	ppmv	scfm	(lbs/hr)	(lbs/hr)	(lbs/hr)
	25	50	500	0.1546	0.4202	2.62E-03
			FOR HRA	0.1546	0.4202	2.62E-03

TIER 3 SCREENING RISK ASSESSMENT DATA INPUT

(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool VI.1

Application Deemed Complete Date	06/26/18
A/N	Case 2, Scenario 2
Facility Name	Del Amo Torrance

1. Stack Data	Input	Units
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Control Efficiency	0.000	
Does source have T-BACT?	NO	
Source type (Point or Volume)	P	P or V
Stack Height or Building Height	20	feet
Building Area	5000	ft ²
Distance-Residential	400	meters
Distance-Commercial	50	meters
Meteorological Station	Hawthorne Airport	
Project Duration (Short term options: 2, 5, or 9 years; Else 30 years)	5	years

Conversion Units (select units)

From

1 feet

To

0.3048 meter

Source Type	Other
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	YES

A/N: ase 2, Scenario 2

[illegible]

TIER 3 SCREEN INPUT & CANCER BURDEN CALCULATION*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*

Screening program used	AERSCREEN
Convert 1-hr to Annual Conc. Factor	0.1

Instructions: Run a screening program at 1 lb/hr rate to get the max 1-hr concentrations at residential & commercial receptors. Enter values into the yellow highlighted cells in the table below. Review risk result in Tier 3 Report.

Modeling emissions rate	0.1260	g/sec
Modeling emissions rate	1.00	lbs/hr
Modeling emissions rate	4.38	tons/yr
Max Hours per day	24	hr/day
Days per week	7	dy/wk
Weeks per year	52	wk/yr

MODELING RESULTS - MAX ONE HOUR

Distance residential	400	meters
Max. 1-hr Conc. at Residential receptor	1.31E+00	µg/m³
Annualized Conc. Residential	0.13	µg/m³
Distance Commerical	50	meters
Max. 1-hr Conc. at Comm. receptor	2.10E+01	µg/m³
Annualized Conc. Commercial	2.10	µg/m³

Annualized X/Q

X/Q Residential	0.030	(µg/m³)/(tons/yr)
X/Q Commercial	0.480	(µg/m³)/(tons/yr)

Hourly X/Q (X/Q Max)

X/Q Residential	1.311	(µg/m³)/(lbs/hr)
X/Q Commercial	21.019	(µg/m³)/(lbs/hr)

A/N: Case 2, Scenario 2**Fac:** Del Amo Torrance**SCREEN INPUT DATA - BRITISH UNITS**

Temperature	1550.00	°F
Stack diameter	18.00	in
Stack height	20.00	ft
Actual exhaust rate	500.00	acfm
Modeling emissions rate	1.00	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	1116.333	K
Stack diameter	0.457	meters
Stack area	0.164	m²
Stack height	6.096	meters
Stack velocity	1.438	m/s
Modeling emissions rate	0.12611	g/s

TIER 3 SCREENING RISK ASSESSMENT REPORT*(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1*A/N: ase 2, Scenario 2Fac: Del Amo TorranceApplication deemed complete date: 6/26/2018**1. Stack Data**

Equipment Type Other

Combustion Eff 0.0
No T-BACT

Operation Schedule 24 hrs/day
7 days/week
52 weeks/year

Stack Height 20 ft

Distance to Residential 400 m

Distance to Commercial 50 m

Meteorological Station Hawthorne Airport

2. Tier 3 Data

Dispersion Factors tables

Point Source

For Chronic X/Q	Table 6
For Acute X/Q max	Table 6.4

Dilution Factors

Receptor	X/Q ($\mu\text{g}/\text{m}^3$)/(tons/yr)	X/Qmax ($\mu\text{g}/\text{m}^3$)/(lbs/hr)
Residential	0.03	1.31
Commercial - Worker	0.48	21.02

Intake and Adjustment Factors

	Residential	Worker
Year of Exposure	5	
Combined Exposure Factor (CEF) - Table 4	389.23	11.17
Worker Adjustment Factor (WAF) - Table 5	1	1.00

[illegible]

4. Emission Calculations

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/day)	R2 (lbs/day)	R2 (lbs/yr)	R2 (tons/yr)
Benzene	1.50E-01	1.50E-01	3.60E+00	3.60E+00	1.31E+03	6.55E-01
Ethyl Benzene	4.20E-01	4.20E-01	1.01E+01	1.01E+01	3.67E+03	1.83E+00
Carbon Disulfide						
Styrene						
Perchloroethylene (Tetrachloroethylene)						
Toluene	2.60E-03	2.60E-03	6.24E-02	6.24E-02	2.27E+01	1.14E-02
Trichloroethylene						
o-Xylene						
p-Xylene						
Polychlorinated Dibenzo-p-Dioxins (PCDD)						
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	9.63E-13	9.63E-13	2.31E-11	2.31E-11	8.41E-09	4.21E-12
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2.62E-12	2.62E-12	6.29E-11	6.29E-11	2.29E-08	1.14E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.64E-12	1.64E-12	3.93E-11	3.93E-11	1.43E-08	7.16E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	2.13E-12	2.13E-12	5.11E-11	5.11E-11	1.86E-08	9.29E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1.93E-12	1.93E-12	4.64E-11	4.64E-11	1.69E-08	8.44E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	9.09E-12	9.09E-12	2.18E-10	2.18E-10	7.94E-08	3.97E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.74E-11	1.74E-11	4.18E-10	4.18E-10	1.52E-07	7.61E-11
Polychlorinated Dibenzofurans (PCDF)						
2,3,7,8-Tetrachlorodibenzofuran	1.04E-11	1.04E-11	2.50E-10	2.50E-10	9.12E-08	4.56E-11
1,2,3,7,8-Pentachlorodibenzofuran	1.12E-11	1.12E-11	2.68E-10	2.68E-10	9.76E-08	4.88E-11
2,3,4,7,8-Pentachlorodibenzofuran	4.51E-12	4.51E-12	1.08E-10	1.08E-10	3.94E-08	1.97E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	8.86E-12	8.86E-12	2.13E-10	2.13E-10	7.74E-08	3.87E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	9.32E-12	9.32E-12	2.24E-10	2.24E-10	8.14E-08	4.07E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	6.40E-12	6.40E-12	1.54E-10	1.54E-10	5.59E-08	2.79E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	1.60E-12	1.60E-12	3.84E-11	3.84E-11	1.40E-08	6.99E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.86E-11	1.86E-11	4.46E-10	4.46E-10	1.62E-07	8.12E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.07E-12	3.07E-12	7.38E-11	7.38E-11	2.69E-08	1.34E-11
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	8.20E-12	8.20E-12	1.97E-10	1.97E-10	7.16E-08	3.58E-11
Total	5.73E-01	5.73E-01	1.37E+01	1.37E+01	5.00E+03	2.50E+00

TIER 3 RESULTS

A/N: Case 2, Scenario 2

Application deemed complete date: 06/26/18

5a. MICR

MICR Resident = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Resident} * CEF \text{ Resident} * MP \text{ Resident} * 1e-6 * M WAF$

MICR Worker = $CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) \text{ Worker} * CEF \text{ Worker} * MP \text{ Worker} * WAF \text{ Worker} * 1e-6 * M WAF$

Compound	Residential	Commercial
Benzene	7.63E-07	3.51E-07
Ethyl Benzene	1.86E-07	8.56E-08
Carbon Disulfide		
Styrene		
Perchloroethylene (Tetrachloroethylene)		
Toluene		
Trichloroethylene		
o-Xylene		
p-Xylene		
Polychlorinated Dibenzo-p-Dioxins (PCDD)		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	2.54E-10	2.13E-11
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	6.92E-10	5.80E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	4.33E-11	3.63E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	5.62E-11	4.71E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	5.10E-11	4.28E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	2.40E-11	2.01E-12
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	1.38E-12	1.16E-13
Polychlorinated Dibenzofurans (PCDF)		
2,3,7,8-Tetrachlorodibenzofuran	1.85E-10	2.31E-11
1,2,3,7,8-Pentachlorodibenzofuran	5.94E-11	7.42E-12
2,3,4,7,8-Pentachlorodibenzofuran	2.40E-10	2.99E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	1.57E-10	1.96E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	1.65E-10	2.06E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	1.13E-10	1.42E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	2.84E-11	3.54E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.29E-11	4.11E-12
1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.45E-12	6.80E-13
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	4.36E-13	5.44E-14
Total	9.51E-07	4.37E-07
	PASS	PASS

5b. Is Cancer Burden Calculation Needed (MICR >1E-6)?

NO

New X/Q at which MICR_{70yr} is one-in-a-million [(µg/m³)/(tons/yr)]:

New Distance, interpolated from X/Q table using New X/Q (meter):

Zone Impact Area (km²):

Zone of Impact Population (7000 person/km²):

Cancer Burden:

6. Hazard Index SummaryA/N: Case 2, Scenario 2Application deemed complete date: 06/26/18

HIA = [Q(lb/hr) * (X/Q)max * MWAf] / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MP * MWAf] / Chronic REL

HIC 8-hr= [Q(ton/yr) * (X/Q) * WAF * MWAf] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL		4.44E-04		Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV	1.17E-01	4.62E-04		Pass	Pass	Pass
Endocrine system - END		4.44E-04		Pass	Pass	Pass
Eye	1.48E-06			Pass	Pass	Pass
Hematopoietic system - HEM	1.17E-01	1.05E-01	1.05E-01	Pass	Pass	Pass
Immune system - IMM	1.17E-01			Pass	Pass	Pass
Kidney - KID		4.40E-04		Pass	Pass	Pass
Nervous system - NS	1.48E-06	1.82E-05		Pass	Pass	Pass
Reproductive system - REP	1.17E-01	4.62E-04		Pass	Pass	Pass
Respiratory system - RES	1.48E-06	2.16E-05		Pass	Pass	Pass
Skin				Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene			7.28E-03		7.28E-03	7.28E-03		7.28E-03		
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene			9.21E-08	9.21E-08			9.21E-08	9.21E-08	9.21E-08	
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total			7.28E-03	9.21E-08	7.28E-03	7.28E-03	9.21E-08	7.28E-03	9.21E-08	

6a. Hazard Index Acute - Worker

A/N: Case 2, Scenario 2

Application deemed complete date: 06/26/18

HIA = [Q(lb/hr) * (X/Q)max Worker * MWAF] / Acute REL

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene			1.17E-01		1.17E-01	1.17E-01		1.17E-01		
Ethyl Benzene										
Carbon Disulfide										
Styrene										
Perchloroethylene (Tetrachloroethylene)										
Toluene			1.48E-06	1.48E-06			1.48E-06	1.48E-06	1.48E-06	
Trichloroethylene										
o-Xylene										
p-Xylene										
Polychlorinated Dibenzo-p-Dioxins (PCDD)										
2,3,7,8-Tetrachlorodibenzo-p-Dioxin										
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin										
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin										
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin										
Polychlorinated Dibenzofurans (PCDF)										
2,3,7,8-Tetrachlorodibenzofuran										
1,2,3,7,8-Pentachlorodibenzofuran										
2,3,4,7,8-Pentachlorodibenzofuran										
1,2,3,4,7,8-Hexachlorodibenzofuran										
1,2,3,6,7,8-Hexachlorodibenzofuran										
2,3,4,6,7,8-Hexachlorodibenzofuran										
1,2,3,7,8,9-Hexachlorodibenzofuran										
1,2,3,4,6,7,8-Heptachlorodibenzofuran										
1,2,3,4,7,8,9-Heptachlorodibenzofuran										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran										
Total			1.17E-01	1.48E-06	1.17E-01	1.17E-01	1.48E-06	1.17E-01	1.48E-06	

DF Emissions for Scenario 1, Case 1:

Worst-case concentrations with blended flowrates [deep soil run 1 @ 350 scfm flowrate + shallow soil run 2 @ 150 scfm]

Dataset:
Sampling Location:
Run Number:
Run Date:
Parameter

STACK SVE1B
S-1B-M428-1
04/11/18

Parameter	Catch Weight (pg)	Concentrations			Emission Rate		Shallow Run 2 @ 150 scfm	For HRA
		(ng/DSCM)	(12% CO ₂)	(@ 7% O ₂)	(gms/sec)	(lbs/hr)	(lbs/hr)	(lbs/hr)
PCDDs								
2,3,7,8-TCDD	1.7	3.27E-04	3.49E-04	3.93E-04	5.40E-14	4.29E-13	5.3417E-13	9.629E-13
Other TCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41453E-12	9.415E-12
1,2,3,7,8-PeCDD	2.76	5.31E-04	5.66E-04	6.37E-04	8.77E-14	6.96E-13	1.92381E-12	2.62E-12
Other PeCDD	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.21026E-12	8.21E-12
1,2,3,4,7,8-HxCDD	2.54	4.89E-04	5.21E-04	5.87E-04	8.07E-14	6.41E-13	9.98259E-13	1.639E-12
1,2,3,6,7,8-HxCDD	2.43	4.67E-04	4.99E-04	5.61E-04	7.72E-14	6.13E-13	1.51481E-12	2.128E-12
1,2,3,7,8,9-HxCDD	2.48	4.77E-04	5.09E-04	5.73E-04	7.88E-14	6.26E-13	1.30728E-12	1.933E-12
Other HxCDD	14.15	2.72E-03	2.90E-03	3.27E-03	4.50E-13	3.57E-12	1.10399E-11	1.461E-11
1,2,3,4,6,7,8-HpCDD	13.1	2.52E-03	2.69E-03	3.02E-03	4.16E-13	3.30E-12	5.78657E-12	9.091E-12
Other HpCDD	14.8	2.85E-03	3.04E-03	3.42E-03	4.70E-13	3.73E-12	5.04431E-12	8.777E-12
OCDD	23.8	4.58E-03	4.88E-03	5.50E-03	7.56E-13	6.00E-12	1.14217E-11	1.742E-11
TOTAL PCDDs	77.76	1.50E-02	1.60E-02	1.80E-02	2.47E-12	1.96E-11	5.72295E-11	7.684E-11
PCDFs								
2,3,7,8-TCDF	3.9	7.50E-04	8.00E-04	9.01E-04	1.24E-13	9.84E-13	9.45241E-12	1.044E-11
Other TCDF	26	5.00E-03	5.34E-03	6.00E-03	8.26E-13	6.56E-12	2.10195E-10	2.168E-10
1,2,3,7,8-PeCDF	2.72	5.23E-04	5.58E-04	6.28E-04	8.64E-14	6.86E-13	1.04825E-11	1.117E-11
2,3,4,7,8-PeCDF	3.23	6.21E-04	6.63E-04	7.46E-04	1.03E-13	8.15E-13	3.69613E-12	4.511E-12
Other PeCDF	17.85	3.43E-03	3.66E-03	4.12E-03	5.67E-13	4.50E-12	7.27714E-11	7.727E-11
1,2,3,4,7,8-HxCDF	7.43	1.43E-03	1.52E-03	1.72E-03	2.36E-13	1.87E-12	6.98327E-12	8.857E-12
1,2,3,6,7,8-HxCDF	5.41	1.04E-03	1.11E-03	1.25E-03	1.72E-13	1.36E-12	7.95274E-12	9.317E-12
2,3,4,6,7,8-HxCDF	1.64	3.15E-04	3.37E-04	3.79E-04	5.21E-14	4.14E-13	5.98349E-12	6.397E-12
1,2,3,7,8,9-HxCDF	1.85	3.56E-04	3.80E-04	4.27E-04	5.88E-14	4.67E-13	1.13459E-12	1.601E-12
Other HxCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0
1,2,3,4,6,7,8-HpCDF	25.2	4.85E-03	5.17E-03	5.82E-03	8.01E-13	6.36E-12	1.22245E-11	1.858E-11
1,2,3,4,7,8,9-HpCDF	1.8	3.46E-04	3.69E-04	4.16E-04	5.72E-14	4.54E-13	2.62062E-12	3.075E-12
Other HpCDF	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39294E-12	4.393E-12
OCDF	11.6	2.23E-03	2.38E-03	2.68E-03	3.69E-13	2.93E-12	5.27153E-12	8.197E-12
TOTAL PCDFs	108.63	2.09E-02	2.23E-02	2.51E-02	3.45E-12	2.74E-11		
TOTAL PCDDs and PCDFs	186.39	3.59E-02	3.82E-02	4.30E-02	5.92E-12	4.70E-11		

TAC Emissions for HRAs

Dataset: Scenario 2, Case 1 - Blended flow rate assuming 150 scfm from shallow wells and 350 scfm from deep wells with worst-case/representative effluent TAC concentrations

shallow soil = worst-case detected effluent data on April 5, 2018 during shallow constant rate testing
deep soil = representative effluent TAC concentrations for deep soil (i.e., detected effluent data on April 13, 2018 during Day 4 of deep constant rate testing)

Study	Sample Location	Sample ID	Sample Date	Time	Benzene	Ethylbenzene	Toluene	Average Flow Rate	Benzene Emission Rate	Ethylbenzene Emission Rate	Toluene Emission Rate
Analytical Method EPA TO-15M					ppmv	ppmv	ppmv	scfm	(lbs/hr)	(lbs/hr)	(lbs/hr)
Molecular Weight (g/mol)					78.1	106.16	92.14				
Shallow Zone	Effluent	VSS01367	04/05/18	1205	1.3	2.2	0.033	150	0.0024	0.0055	7.22E-05
Deep Zone	Effluent	VSS01391	04/13/18	1151	19	39	0.5	350	0.0822	0.2294	2.55E-03
								FOR HRA	0.0846	0.235	2.62E-03

Dataset: Scenario 2, Case 2 - Assumed total flow rate of 500 scfm multiplied by a benzene concentration of 25 ppmv and ethylbenzene concentration of 50 ppmv

Toluene rate assumed to be Case 1

Revised 1 (B):2 (EB) ratio	Benzene	Ethylbenzene	Average Flow Rate	Benzene Emission Rate	Ethylbenzene Emission Rate	Toluene Emission Rate
	ppmv	ppmv	scfm	(lbs/hr)	(lbs/hr)	(lbs/hr)
	25	50	500	0.1546	0.4202	2.62E-03
			FOR HRA	0.1546	0.4202	2.62E-03